3 COLD STORES

3.1 GENERAL

3.1.1 Scope

1 This Part describes requirements specific to insulation and construction of Walk-in refrigerators and freezers which can be used for dietetics, autopsy and laboratory uses.

2 Related Sections are as follows:

Section 13	Masonry
Section 22	Air Conditioning, Refrigeration and Ventilation
Section 24	Finishes to Buildings

3.1.2 References

1 The following standards are referred to in this Section:

BS 874.....Methods for determining thermal insulating properties (EN 12667 Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance; EN 12664 Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Dry and moist products of medium and low thermal resistance; EN 12939 Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Thick products of high and medium thermal resistance; ISO 8990 Thermal insulation — Determination of steady-state thermal transmission properties — Calibrated and guarded hot box)

BS 1449.....Steel plate, sheet and strip

BS 2502.....Specification for manufacture of sectional cold rooms (walk-in type)

BS 3261-1 .....Specification for unbacked flexible PVC flooring (ISO 10581 Resilient floor coverings — Homogeneous poly(vinyl chloride) floor covering — Specifications)

BS 6319.....Testing of resin and polymer/cement compositions for use in construction

3.1.3 Submittals

1 The Contractor is to furnish the following prior to commencement of the works:

(a) manufacturer's literature and data:
  (i) walk-in units, including assembly instructions
  (ii) condensing units, with mounting rack where required
  (iii) unit coolers
  (iv) temperature controls and alarms
  (v) temperature recorders for mortuary refrigerators
  (vi) mortuary walk-in ventilation accessories
  (vii) diagrams and details of piping, wiring and controls

(b) operating test data

(c) manufacturer’s standard maintenance and operating manuals.

3.2 WALK-IN REFRIGERATOR OR FREEZER CONSTRUCTION

3.2.1 General

1 Walk-In refrigerators/freezers shall be prefabricated, sectional, all-metal clad, modular and designed for easy and accurate assembly and shall comply with the relevant provisions of BS 2502

3.2.2 Size

1 Room dimensions shall be as shown on drawings with a minimum overall height of 2500 mm, unless shown otherwise.

3.2.3 Doors

1 Doors shall be 1220 mm wide by 1980 mm high, except doors for freezers with floor area less than 14 m^2 may be 920 mm (nominal) wide.

3.2.4 Floor Finish

1 Floor finish shall be seamless modified epoxy polyurethane system with the following properties and conforming to BS 3261-1.

Compressive Strength, BS 6319	> 95 MPa
Flexural Strength, BS 6319	> 20 MPa
Tensile Strength, BS 6319	> 10 MPa
Service Temperature	-40 to 120^{O}C
Thermal shock resistant	Resist

3.2.5 Metal Finishing

1 Inside facing of walls and ceiling, and outside facing of exposed walls shall be stainless steel, to BS 1449.

3.3 WALL PANEL CONSTRUCTION

3.3.1 General

1 Wall panels shall:

(a) be 100 mm thick with precisely formed interior and exterior metal pans

(b) be filled with foamed-in-place urethane foam with an overall heat transfer coefficient (U) of 0.03

(c) be interchangeable

(d) be available in nominal 300, 600, 900 and 1200 mm widths

(e) be without wood or metal structural members

(f) have quick-lock panel fasteners.

3.3.2 Panel edges

1 Panel edges shall be foamed-in-place, tongue-and-grooved urethane to assure tight joints.

2 There shall be gaskets on the interior and exterior of each panel along every tongue to provide a gasketed seal at each panel joint.

3.3.3 Insulation

1 Insulation shall be "pour-type" urethane, foamed-in-place with an expanding agent with a coefficient of thermal conductivity (k) of not more than 0.12.

2 The insulation shall be 97% closed cell with a flame spread rating of 25 or less, when tested in accordance with BS 2502.

3 Fibreglass, polystyrene or similar materials are not acceptable as insulation.

3.3.4 Door Panel and Door

1 There shall be a channel thermal breaker type reinforcing steel frame around the entire perimeter of the door opening.

2 The door is to be an in-fitting flush-mounted type with dual flexible blade wiper gasket on the bottom and a replaceable magnetic gasket on the top edge and along both sides.

3 The door shall incorporate a heated, double glass view window.

4 Door construction shall include an aluminium diamond plate on the inside of the door panel and shall be hung with a minimum of three hinges.

5 A hydraulic exterior door closer is to be incorporated to prevent slamming and assure secure closing.

6 For doors with a width of 1220 mm or wider, the door hinges shall be the self-closing cam-lift type hinges. They shall have a chrome plated or polished aluminium finish.

7 The doors shall be lockable but with an inside safety release mechanism to prevent anyone from being locked inside.

8 The door shall incorporate a concealed, energy use selective, anti-sweat heater wire circuit which will provide sufficient heat to prevent condensation and frost formation at the door jambs and exterior edges of the door on all sides.

9 A two way toggle switch outside the door and inside the unit shall be provided with a pilot light and a top mounted junction box. This switch is to operate all lights in the walk-in refrigerator/freezer. Fixtures shall be vapour proof incandescent

10 The door shall incorporate a 50 mm minimum diameter, dial type, flush mounted thermometer.

11 All freezers operating at -17^{o}C or lower shall incorporate a two-way type port to allow for an increase or decrease of air pressure on the interior of the freezer in order to equalise with air pressure on the exterior. The ports shall be automatically controlled, UL approved, anti-sweat heaters. The complete device is to be provided and be listed assembled and ready for connection. The port shall be installed in a wall panel away from the direct air stream flowing from the coils.

12 Wherever compartment dimensions exceed clear-span ability of ceiling panels, an I-beam support on the exterior of the ceiling or other designated support system shall be provided. Beams or posts within compartments are not acceptable unless otherwise approved by the Engineer.

3.4 REFRIGERATION EQUIPMENT

3.4.1 General Requirements

1 Mechanical equipment as needed for condensing units or unit coolers will be incorporated as designated and installed in accordance with the respective manufacturer's specification as designated or as approved by the Engineer.

3.5 INSTALLATION

3.5.1 General Requirements

1 The Contractor shall assemble walk-in units and install refrigeration equipment as described in the respective manufacturer's instructions. All panel joints shall be made tight and all panel penetrations shall be sealed to prevent condensation or frosting.

2 Unit coolers shall be suspended below the ceiling sufficiently to allow cleaning the top of the unit cooler (890 mm minimum).

3 Penetrations for lights and other devices neatly drilled.

4 Piping, pipe insulation and refrigerant shall be provided in accordance with Section 22, Air Conditioning, Refrigeration and Ventilation.

5 Installation of controls shall be as specified by respective manufacturer's.

3.5.2 Start-Up, and Performance Tests and Instructions

1 Testing shall be performed in accordance with manufacturer's specifications. Each system shall be operated for eight hours and the conditions recorded hourly.

2 The Contractor shall submit the following information:

(a) station, building name and system identification, Contractor, date and time.

(b) compressor nameplate data: make, model, horsepower, RPM, refrigerant and charge in grams.

(c) compressor operation: approximate percentage running time, pressure gauge readings, actual amps (starting and running), condenser water temperature in and out, or condenser entering air temperature.

(d) room temperatures

(e) defrost and drain functions of unit coolers.

3 The Contractor shall demonstrate alarm functions.

END OF PART