

PART 1 - GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop drawings:
 - .1 Indicate equipment layout drawing and mounting bolt locations.
 - .2 Furnish catalogue description, illustration and specification data for each piece of equipment and accessory.
- .4 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.

1.2 CLOSEOUT SUBMITTALS

- .1 Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
 - .1 Include safety instructions and requirements for replacement of components that have sustained impact damage.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's instructions.
 - .2 On receipt, inspect the product to determine if it has sustained damage during transportation.
 - .3 Preserve packaging until it has been determined that product is undamaged.
- .2 Packaging Waste Management: remove for reuse and return pallets, crates and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- .1 Interior pre-engineered heavy-duty guardrail system to protect exterior of Walk-in Freezer boxes from impact damage, including damage that may be caused by pallet jack traffic.

2.2 HEAVY-DUTY GUARDRAIL BARRIER SYSTEM

- .1 Heavy-duty double rail column system – general:
 - .1 Absorbs impact of 4536 kg load at 6.44km/hr (10,000 lb load at 4 mph).
 - .2 Overall height at columns: 1120 mm.
- .2 System components:
 - .1 Baseplates:
 - .1 254 mm x 254 mm x 12.5 mm thick with 19 mm diameter factory-punched mounting holes.
 - .2 Offset type where indicated.
 - .2 Guard Rail Columns:
 - .1 Double rail type.
 - .2 Hollow steel section to ASTM 500, Grade C.
 - .3 2.5 mm (12 gauge).
 - .4 Seam welded square 127 mm x 127 mm.
 - .5 Shop-welded to baseplate.
 - .3 Guard Rails:
 - .1 Roll formed steel.
 - .2 2.5 mm (12 gauge).
 - .3 300 mm high profile, 4.76 mm thick end plates factory-punched with two connection holes.
 - .4 Lift-out brackets.
 - .4 Post caps:
 - .1 Black plastic.
 - .5 Fasteners.
 - .1 As recommended by guardrail system manufacturer, including carriage bolts with washer and T-nut head tork socket.
- .3 Floor anchor bolts: as required to provide adequate anchoring.
 - .1 Minimum 15.9 mm x 115 mm anchors with a minimum 65 mm embedment.
- .4 Finish: powder-coated, oven-cured safety yellow.
- .5 Acceptable material: Cogan Heavy-Duty Guardrail Barrier or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- .2 Install guardrail system to manufacturer's instructions and reviewed shop drawings.
- .3 Install with adequate anchoring in concrete floor.
 - .1 Scan floor at anchoring points to ensure there will not be interference with existing services or other embedded obstacles.
- .4 Coordinate with installation of Walk-in Freezers.

- .5 There shall be no modifications to the guardrail system on site without the written approval by the guardrail system manufacturer and the Departmental Representative.

3.2 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 1 - GENERAL

1.1 REFERENCES

- .1 American National Standards Institute/National Fire Protection Association (ANSI/NFPA)
 - .1 ANSI/NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials.
- .2 ASTM International
 - .1 ASTM A 167, Standard Specification for Stainless and b52Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM A 240/A 240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - .3 ASTM A 480/A 480M, Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.
 - .1 Finish for sheet: No. 4 Finish-General purpose polished finish, one or both sides.
 - .4 ASTM A 653/A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .5 ASTM B 88M, Standard Specification for Seamless Copper Water Tube Metric.
 - .6 ASTM B 280, Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
 - .7 ASTM C 1184 Standard Specifications for Structural silicone Sealants.
 - .8 ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .9 ASTM E 162, Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.
- .3 Canada Green Building Council (CaGBC)
- .4 CSA International
 - .1 CSA B52 (2013), Mechanical Refrigeration Code.
 - .2 CSA C22.2 No.137, Electric Luminaires for Use in Hazardous Locations.
- .5 Underwriters' Laboratories of Canada
 - .1 Insulation for panels: to CAN/ULC-S705.1, Class 3, foamed-in-place polyurethane (urethane), closed cell.
- .6 Federal Halocarbon Regulations

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Samples:
 - .1 Submit sample of insulated Walk-in Freezer box panel complete with cam lock. Metal skins in material, gauge and finish specified.

- .3 Product Data:
 - .1 Submit complete materials list, including catalogue product data of all materials, equipment and products for Work of this Section, including product characteristics, performance criteria, physical size, finish and limitations.
 - .1 Walk-in Freezer panels: wall, floor and ceiling.
 - .2 Panel cam-locking device.
 - .3 Doors:
 - .1 Walk-in Freezer door panel, frame and related accessories:
 - .1 Magnetic gaskets (top and sides).
 - .2 Bottom seal.
 - .3 Sill plate.
 - .4 Threshold.
 - .5 Thermostatically controlled warmer cable at full perimeter.
 - .6 Protection plates.
 - .2 Cold Room door, frame and related accessories.
 - .4 Door hardware.
 - .1 Hinges.
 - .2 Latch with padlock provision and interior release.
 - .3 Door closer/assisted latching device.
 - .5 Walk-in Freezer ceiling panel roof support clips (for locking onto each female cam lock pin).
 - .6 Thermometer (dial)
 - .7 Lights.
 - .8 Rub rail wall protectors.
 - .9 Pressure relief port.
 - .10 Digital alarm and light management system:
 - .1 Lighting control.
 - .2 Temperature monitoring and display.
 - .3 Temperature sensor/probe.
 - .4 Temperature alarm.
 - .5 Door open alarm.
 - .6 Panic alarm.
 - .7 Alarm muting.
 - .8 Battery back-up.
 - .9 Remote alarm devices: buzzer, strobe light.
 - .11 Isolation coating (Walk-in Freezer panel to concrete).
 - .12 Sealants.
 - .13 Refrigeration components:
 - .1 Compressors.
 - .2 Evaporators.
 - .3 Condensers.
 - .4 Freezers' defrost system.
 - .5 All related equipment, accessories and controls.
- .4 Submit detailed technical and engineering data. Include refrigeration calculations and electrical calculations for Walk-in Freezer No.1, Walk-in Freezer No.2 and Cold Room.

- .5 Shop Drawings:
 - .1 Submit complete shop fabrication and installation drawings prepared in AutoCAD and PDF format. Drawing scale to be same as tender documents, including: plans, sections, elevations and details.
 - .2 Indicate on drawings: Walk-in Freezer No.1 and No.2 panel layout and panel sizes for walls, floor and ceiling.
 - .1 Indicate all penetrations through panels complete with penetration details.
 - .2 All penetrations to be in accessible locations.
 - .3 Penetration locations are subject to review and approval by Departmental Representative.
 - .3 Submit anchorage and attachment drawings.
 - .4 Submit detailed drawings, plans and sections, for all other custom fabricated items, indicating construction methods, connections, type and thickness of material, hardware, fittings and finish.
 - .5 Submit construction details of equipment by drawings and manufacturers' literature.
 - .6 Submit separate plan drawing for mechanical and electrical service requirements (minimum scale 1:20). Include dimensioned service connection points, distances and heights using readily recognizable standards symbols. Include an individual equipment list and service schedule, including the following information as applicable:
 - .1 Electric phase, voltage and kilowatts.
 - .2 Other data for installation of all mechanical and electrical services.
 - .7 Refrigeration equipment:
 - .1 Submit schematic layouts showing condensers, compressors, evaporators, refrigerant piping and accessories.
 - .2 Submit complete pipe sizing data.
 - .8 Provide installation details.
- .6 Corrections Service Canada (CSC) Submittals:
 - .1 CSC requires that the following documents are completed and submitted. The Departmental Representative will provide the forms: (copies are attached for reference)
 - .1 Leak Test Notice for Refrigeration and Air-Conditioning System.
 - .2 Refrigeration System or Air-Conditioning System Service Log.
- .7 Construction/Demolition Waste Management and Disposal Submittals:
 - .1 Submit Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.3 CLOSEOUT
SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Prepare as work progresses, record drawings showing as-built conditions. Submit when work is complete.

- .3 Operation and Maintenance Data:
 - .1 Prepare operation and maintenance manual for the complete system and all of its assembled components including accessories, alarms and control instruments.
 - .2 Include an organized compilation of all manufacturers' operation and maintenance manuals.
 - .3 Include an explanation in layman's language of how all components fit together and describe proper operating procedures and maintenance procedures:
 - .1 Walk-in Freezer No.1 and No.2:
 - .1 Related accessories and refrigeration equipment and accessories for incorporation into manual.
 - .2 Cold Room:
 - .1 Refrigeration equipment and accessories.
 - .4 Include:
 - .1 Maintenance program with checklist of activities to be performed to maintain warranties complete with time schedule.
 - .2 Complete list of components requiring routine service and/or replacement.
 - .3 Complete list of replacement parts.
- .4 Warranty documentation.

1.4 WARRANTY

- .1 Submit warranty documents in accordance with Section 01 78 00 – Closeout Submittals.
 - .1 Walk-in Freezer box: one-year.
 - .2 Refrigeration system (compressor and condenser components): four year extended warranty for a total of five years.

1.5 REGULATORY REQUIREMENTS

- .1 All work and material shall be in full accordance with the latest rules and regulations of the Federal, Provincial, and Municipal Departments of Health, and prevailing rules and regulations governing adequate protection and/or guarding of moving objects and/or otherwise hazardous locations.
- .2 All work and materials shall be in conformance with CFIA (Canadian Food Inspection Agency) standards.
- .3 Work under this Section shall conform to the applicable standards and revisions as established by the Canadian Standards Association.
- .4 Current regulations, building codes, mechanical refrigerant code applying to this Section shall be followed.
- .5 All electrical equipment shall be approved by the Canadian Standards Association and bear a CSA. Standard Council of Canada label.

1.6 QUALITY
ASSURANCE

- .1 Installer Qualifications:
 - .1 Installer shall have ten (10) years demonstrated experience on projects of similar scope with documentation proving successful completion.
- .2 Installation Qualifications:
 - .1 Installation must be by skilled tradesmen holding a trade qualification license.
- .3 Requirement for Manufacturer's Representative:
 - .1 Manufacturer shall provide a representative for intermittent on-site support during the installation
 - .2 Manufacturer shall provide a representative for commissioning of:
 - .1 Walk-in Freezer No. 1
 - .2 Walk-in Freezer No.2
 - .3 Cold Room.
- .4 Pre-installation Meetings:
 - .1 Verify project requirements, substrate conditions, manufacturer's installation instructions and warranty requirements.
 - .2 Review project construction timeline to ensure compliance or discuss modifications as required.
 - .3 Interface with work of other specification Sections.
 - .4 Establish the frequency for site visits by the Departmental; Representative and inspections by manufacturer's representative.

1.7 COORDINATION

- .1 Work of this Section requires close coordination with work in Mechanical, Fire Suppression, Electrical, Architectural and Structural Sections. Coordinate all work to assure an orderly progress.
- .2 Walk-in Freezer supplier has responsibility to provide secure backing for wall mounted rub rails and other ceiling mounted equipment as shown.
- .3 Walk-in Freezer supplier has full responsibility for the following:
 - .1 Making openings for service penetrations to and from the Walk-in Freezer box.
 - .2 Keeping the number of these service penetrations to a minimum.
 - .3 Properly sealing all service penetrations in the Walk-in Freezer box.

1.8 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in

- accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect equipment and materials from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.
- .4 Develop Waste Reduction Workplan related to Work of this Section. Packaging Waste Management: Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.9 OBSERVED MOCK-UP:
WALK-IN FREEZER BOX

- .1 Construct mock-up in presence of Departmental Representative and in accordance with Section 01 45 00 – Quality Control.
- .2 Departmental Representative will observe all phases of the mock-up described below.
- .3 Make arrangements, for Walk-in Freezer box manufacturer's representative to be present.
- .4 Mock-up to be performed at the start of the first Walk-in Freezer box installation as follows:
 - .1 Prior to mock-up:
 - .1 Ensure surface over radiant floor heating system is level, acceptable for floor panel installation.
 - .2 Examine panels and organize panel layout sequence.
 - .3 Do not begin floor panel installation until time of mock-up.
 - .2 Mock-up:
 - .1 Observed installation of floor panels and installation of wall panels to floor panels.
- .5 Have on site for review by Departmental Representative at mock-up location:
 - .1 Complete set of drawings and specifications.
 - .2 All panel materials, accessories, Walk-in Freezer box panel manufacturer's approved isolation coating, and sealant with original wrapping/containers identifying product.
 - .3 Reviewed shop drawings and product data.
 - .4 Manufacturer's detailed installation instructions.
- .6 Construct mock-up in accordance with manufacturer's written instructions.
- .7 Provide 72-hour notice of start time and date of mock-up installation.
- .8 When accepted, mock-up components may remain in place and will demonstrate minimum standard for the remainder of the work.

PART 2 - PRODUCTS

2.1 WALK-IN FREEZERS

- .1 Walk-in Freezer boxes: general
 - .1 Indoor type with remote refrigeration.
 - .2 Modular design for ease of repair or part replacement.
 - .3 Panels to meet CFIA and USDA requirements.
 - .1 Dimensions:
 - .1 Overall dimensions: as indicated.
 - .2 Wall, ceiling and floor panel sizes as indicated.
 - .3 Acceptable material: Master-bilt or approved equal, meeting specifications noted below.
 - .2 Insulation for panels:
 - .1 To CAN/ULC-S705.1, HCFC Free, FM-4880 Class 1, foamed-in-place polyurethane (urethane), 97% closed cell.
 - .2 In accordance with ASTM E84: flame spread 25, smoke 400 at 100mm thickness.
 - .3 Stainless steel sheet, thickness and texture as indicated.
- .2 Walk-in Freezer panel sections – general:
 - .1 Precision die-formed metal pans accurately spaced and insulated.
 - .2 Panel edges to have tongue and grooves, foamed-in-place, to assure airtight, vapour-proof joints.
 - .3 Bulb-type NSF-listed gaskets foamed-in-place on interior and exterior edge of each panel.
 - .4 Joints are to be mechanically closed.
 - .5 Reinforcement is to be provided as required.
- .3 Walk-in Freezer panels: (wall, floor and ceiling)
 - .1 Wall and ceiling panels:
 - .1 Finish: metal pan finish for interior and exterior faces: 0.70mm (22 gauge) stainless steel, stucco-type texture to approved sample.
 - .2 Insulation: foamed-in-place polyurethane (urethane), closed cell, 100mm thick, RSI 5.63 (R32).
 - .3 Ceiling hanger suspension as noted below.
 - .2 Floor panels:
 - .1 Finish: metal pan finish:
 - .1 Exterior/outer face: 0.70mm (22 gauge) stainless steel.
 - .2 Interior/inner face: 1.5mm (16 gauge) smooth stainless steel.
 - .2 Insulation: foamed-in-place polyurethane (urethane), closed cell, 100mm thick, RSI 5.63 (R32).
 - .3 Heavy duty floor design: panel to contain a layer of foamed-in-place plywood on interior/inner side and other supports as required to support a loaded electric pallet jack or equivalent transporter.
 - .3 Interior floor protection plate overlay:
 - .1 Supplied by Section 05 50 00 – Metal Fabrications.
 - .2 Installed by this Section.
- .4 Panel mechanical locking devices:
 - .1 Panel sections to have all metal cam-action locking devices

- (with latch supports and plug buttons), spaced at maximum 950 mm vertically, 600 mm horizontally, permanently foamed-in-place in the exact position for perfect alignment and ease of assembly with the use of a simple hexagon wrench.
 - .2 Operation: the cam-lock arm assembly in one panel engages the pin assembly of the adjacent panel and draws, secures and locks the sealant equipped panels together forming a vapor proof tight urethane panel joint.
- .5 Panels at Door: general
 - .1 Insulated and finished as per exterior and interior faces of wall panels as per indications, with clear door opening of size as indicated, reinforced to prevent door panels from twisting, racking or warping.
 - .2 Each opening to be equipped with single door as per indications.
 - .3 Ensure that door will close and fully seal the opening.
 - .4 All door hardware to be attached to large 12 mm thick, non-conducting synthetic tapping plates.
- .6 Walk-in Freezer Door, Frame and Hardware:
 - .1 Frame:
 - .1 Rigid frame, steel reinforced to support door, clad with stainless steel sheet.
 - .2 Provide heavy duty steel reinforcement for hinges and other hardware items as required.
 - .1 All door hardware to be attached to large 12 mm thick, non-conducting synthetic tapping plates.
 - .2 Door: (hinges type)
 - .1 Flush-mounted, in-fitting, with swing and size as indicated.
 - .2 Designed and certified for use in Walk-in Freezer applications.
 - .3 Polyurethane insulated with stainless steel pans. Insulation type and thickness and steel pans to match wall panels as per indications.
 - .4 Door shall be constructed to incorporate a heavy-duty, molded thermal break strip permanently foamed-in-place.
 - .5 Fully adjustable hinge backing plate foamed-in-place inside door.
 - .1 6mm thick steel enclosed within 2.0mm (14 gauge) housing
 - .2 Allows adjustment of door in any direction without removal of door or its frame.
 - .6 Door Accessories:
 - .1 Gaskets: (top and two sides)
 - .1 Soft thermoplastic gasket with magnetic steel core.
 - .2 Oil, fat, water and sunlight resistant.
 - .3 Capable of being easily replaced.
 - .2 Bottom seal:
 - .1 Adjustable rubber wiper gasket and mounting angle at door bottom.
 - .2 Capable of being easily replaced.

- .3 Sill plate.
 - .1 3.0mm (10 gauge) stainless steel.
- .4 Threshold plate:
 - .1 Heavy-duty, non-slip, removable ramp type threshold, minimum 5.0 mm stainless steel.
 - .2 Fastened to floor panel and easily removable.
- .5 Door light assembly.
 - .1 LED.
- .6 Thermometer:
 - .1 50 mm diameter flush-face dial-type thermometer to provide temperature readings from -51 degrees C to 27 degrees C and mounted on hinge side of door panel approximately 1525 mm from floor.
 - .1 Cover sensing bulb with protective stainless steel moulding.
- .7 Heater cable at door perimeter:
 - .1 In-fitting door jamb shall be provided with built-in, concealed, thermostatically-controlled low wattage anti-sweat heater cables at entire perimeter of door, jambs and head, and with a double-loop under threshold at bottom of door inter-wired with the door frame heater cables.
 - .2 Heater cables shall provide sufficient heat to prevent condensation and/or frost accumulation.
 - .3 Heater cable shall be provided in an electrically safe housing.
 - .4 Adjustable power output of heater with high temperature cut-off.
 - .5 Heater cable shall be easily replaceable without need for clips or special tools.
- .8 Protection plates: (at exterior and interior door faces)
 - .1 Stainless steel type 304 with 2B finish, 1.2mm (18 gauge) x 1220 mm high.
- .9 Conduit for inner wiring of door panel must be concealed in the polyurethane foam panel. Door section to be field wired to surface-mounted 100 mm x 100 mm junction box on the interior door panel. The complete door section shall be UL listed and CSA certified and labeled thus.
- .3 Door Hardware:
 - .1 Hinges: (3 per door)
 - .1 Self-closing heavy-duty corrosion-resistant cam-rise hinge, precision-machined stainless

- steel cams to gently raise and lower door.
 - .2 Stainless steel flange, 5mm thick strap, 16 mm diameter cam pins, drilled for 10 mm screws.
 - .3 Strap length and offset to suit load rating (door width, door weight and other conditions) as required to maximize performance, strap length minimum 710 mm.
 - .4 Acceptable material: Kason Series 1377L Heavy Duty Cam-Rise Stainless Steel Self-closing Hinge or approved equal.
 - .2 Latch with Inside Release:
 - .1 Stainless steel corrosion-resistant latch to match hinges with padlocking provision and stainless steel rod and flange inside release, glow-in-the-dark plastic knob; size to suit door panel.
 - .2 Stainless steel inside release to open padlocked latch from inside the Walk-in Freezer.
 - .3 Material: stainless steel #316 body and strike housing with #304 stainless steel roller.
 - .4 Mounting: holes drilled for fasteners recommended by manufacturer.
 - .5 Tamper resistant locking mechanism and mounting built-in.
 - .6 Roller strike to assure precise adjustment.
 - .7 Acceptable material: Kason 778 Stainless steel Safeguard Latch and 481SC Stainless Steel Inside Release or approved equal.
 - .3 Door Closer/Assisted Latching Device: (exterior mount)
 - .1 Spring action stainless steel closer, mounting plate and bend-resistant hook with polymer roller; offset to suit.
 - .2 Operation: operates by direct force adding to natural swing momentum. Designed to overcome slowing action of gaskets and air pressure, providing fast, full closure for heavy walk-in doors.
 - .3 Acceptable material: Kason 1095 Spring Action Door Closer or approved equal.
 - .7 Interior floor protection plate overlay: (over Freezer floor panels)
 - .1 Supplied by Section 05 50 00 – Metal Fabrications: diamond tread panels, 3 mm (11 gauge) thick stainless steel
 - .2 Panels installed by this Section.
 - .8 Ceiling panel roof support clips:
 - .1 For locking onto each female cam lock pin at ceiling panels as part of ceiling hanger suspension for ceiling panels.
 - .2 Support system to be external to room with no visible connections from the interior.
 - .3 Ceiling panel roof support clips designed by Walk-in Freezer panel manufacturer for insertion into female camlock.
 - .4 Clips are to be secured with components and purpose made

sub-structure by others.

- .9 Rub-rail wall protectors: (at interior of Walk-in Freezer No.1 and No.2)
 - .1 Hat shaped 50 x 150 x 50 with 50 mm projection, 1.6 mm (16 gauge) #304, fastened to walk-in with #10 x 50 mm stainless steel screws through pre-punched holes in top and bottom flanges.
 - .2 Mitre joint and weld.
 - .3 Box open ends.
 - .4 Top and vertical ends where rail makes contact with wall panels are to be sealed. Seal in accordance with Walk-in Freezer panel manufacturer.
- .10 Ramp: access into Walk-in Freezer boxes.
 - .1 Supplied and installed by Section 05 50 00 – Metal Fabrications.
- .11 Lighting:
 - .1 LED lights:
 - .1 Specifically designed for wet and low temperature environments. Operating temperature range: -40C to 40C. Luminaire to meet IP-65 for wet and cold applications
 - .2 Size: 1266.8 mm long x 158.0 mm wide x 71.5 mm deep.
 - .3 Housing: Injection molded polycarbonate with integral gasket.
 - .4 Diffuser: clear molded high impact polycarbonate diffuser with stainless steel latches for easy access to lamps.
 - .5 Tamper resistant fastener kit.
 - .6 Reaches full light immediately even in cold temperatures.
 - .7 Electrical: 120 – 277VAC at 50/60 Hz
 - .1 58W, 0.48 amps, 6000 lumens.
 - .8 Acceptable material; Kason 1810LX6000 LED Fixture or approved equal.
 - .9 Operational controls for Walk-in Freezer lights:
 - .1 Motion sensor (specified below) located inside Walk-in Freezer, to be operational at all times, or,
 - .2 Lighting control through “Digital Alarm and Light Management System”: (specified below)
 - .1 By pressing the button on the keypad, which will switch alternatively ON and OFF, or,
 - .3 Lighting control through “Digital Alarm and Light Management System”: (specified below)
 - .1 By detecting the opening of the door which will turn lights ON and the closing door will initiate a user-defined time delay; the light will then go OFF after this delay.
 - .2 Motion sensor:
 - .1 Low bay sensor with gasketed, water-tight enclosure and mounting kit to meet IP65.

- .2 Designed for wet and low temperature environments. Operating temperature range: -40C to 40C. Luminaire to meet IP-65 for wet and cold applications
 - .3 Size: 100 mm x 100 mm x 40 mm deep.
 - .4 Material: polycarbonate.
 - .5 Electrical: 120 – 277VAC at 50/60 Hz; electrical connection 12.7 mm NPT thread, 342.9 mm AWG wire.
 - .6 Operation: Passive infrared sensor detects motion and turns light on at temperatures below freezing. Uses DIP switches to set time delay and sensitivity.
 - .7 Acceptable material: Kason 1901A00005 Low Bay Motion Sensor or approved equal.
- .12 Pressure relief port:
 - .1 Provide factory mounted pressure relief port of type required to equalize atmospheric pressure inside and outside the Walk-in Freezer caused by temperature changes due to product loading, door opening and defrost cycles.
 - .2 Relief port to be equipped with 115/60/1 AC heater element to prevent freezing.
- .13 Door fan switch:
 - .1 To shut off evaporator coils when door is open.
 - .2 If the door stays open for a user-defined set duration, fans re-start to avoid critical temperature increase.
 - .3 Battery back-up.
- .14 Digital alarm and light management system:
 - .1 Digital alarm and light management module shall be complete with battery backup, acceptable material: Norbec Intelligence 13 or approved equal and all related accessories and other components as required to achieve the following operational requirements.
 - .1 Lighting Control:
 - .1 Controlled through the “Digital Alarm and Light Management System” in two ways:
 - .1 By pressing a button on the keypad will switch lights alternatively ON and OFF, or
 - .2 By detecting the opening of the door, which will turn the lights ON and closing the door will initiate a user-defined adjustable time delay; the light will then go OFF after the delay, or
 - .2 Lighting is also controlled at all times by a motion sensor/timer (indicated above), located in Walk-in Freezer.
 - .2 Temperature monitoring and display:
 - .1 The unit displays the temperature in Celsius.
 - .2 Should an alarm be present, the display will show the temperature and alarm message alternatively.
 - .3 Temperature sensor/probe:
 - .1 Probe is to be placed away from door and

- away from lights in a manner not to be subject to damage or erroneous temperature readings.
- .4 Temperature alarm:
 - .1 High and low temperature alarm settings and activation delay can be set by the user.
 - .2 Alarms are activated after reaching the temperature alarm settings.
 - .3 An audible alarm from the keypad will sound at approximately 80 dB.
 - .4 The keypad display will show a message alternately with the actual temperature.
 - .5 The 115 Volt alarm signal will turn ON.
 - .6 Also see remote alarm devices, indicated below.
 - .5 Door-open alarm:
 - .1 If the door remains open for more than a pre-defined adjustable duration, the door-open alarm is triggered and an audible alarm from the keypad will occur.
 - .2 The keypad display will show a message alternately with the actual temperature.
 - .3 The 115 Volt alarm signal will turn ON.
 - .6 Panic alarm:
 - .1 Audible alarm, as required in case of entrapment or trouble inside.
 - .2 This alarm is triggered by an interior backlit push button located next to the door opening.
 - .3 When the button is pressed, lights are automatically turned on inside the Walk-in Freezer, an audible alarm (approximately 80 dB) from the keypad and a louder alarm from an external buzzer will occur. External buzzer powered by battery back-up power.
 - .1 The alarm will be active until the door is opened.
 - .2 Provide instructions on lamacoid plate to this effect for mounting inside the Walk-in Freezer next to button. Submit wording for review and approval.
 - .4 The keypad display will show message alternately with the actual temperature.
 - .7 Alarm muting:
 - .1 Keyboard to have a SILENCE button which when pressed will mute an audible signal.
 - .2 The associated alarm message and the 115 Volt signal are to remain until the alarm condition disappears.
 - .8 Battery back-up:
 - .1 9-Volt battery holder to be located above the controller.
 - .2 Include battery.
 - .3 The battery shall maintain the temperature display and alarm messages in operation during power outages for approximately

- 24-hours.
 - .4 It is a requirement to have the external alarm signal on power outages, the Dry Contact signal option, with proper parameter settings, is required to achieve this functionality.
 - .9 Dry contact for external alarm signals:
 - .1 Standard external alarm is a 115 Volt signal which can be converted to a dry contact (Normally Closed) that opens an alarm signal. This option also includes a normally open contact.
 - .2 This is for the remote alarm devices at the Main Corridor, Warehouse and Building Exterior.
 - .10 Remote alarm devices, warning horn and strobe combination:
 - .1 Strobe beacon combined with high decibel horn (100 dB at 1 meter, 90 dB at 3 meters) suitable for hearing any of the alarms at remote locations.
 - .2 Surface mount.
 - .3 Size: 140mm high x 140mm wide.
 - .4 Thermoplastic housing, outdoor rated.
 - .5 Operating voltage: 120V AC, strobe current 0.115A, horn current 0.033A.
 - .6 Lens colour: blue.
 - .7 Light output to UL 1638: 20cd
 - .8 Devices muted independently from keyboard buzzer with their own MUTE button.
 - .9 Remote locations: as indicated
 - .1 Building Exterior.
 - .2 In Main Corridor, South of existing Cold Room door.
 - .3 In Warehouse.
- .15 Penetrations through Walk-in Freezer box panels:
 - .1 Seal all joints, openings, service lines: electrical wiring, conduits, refrigerant piping, drain lines etc.
 - .2 Locate service penetrations in accessible locations.
 - .3 Locations of service penetrations are to be in accordance with reviewed shop Drawings and are subject to review and approval by Departmental Representative
 - .4 Penetrations for conduits, piping etc. to accommodate electrical wiring conduits, refrigeration piping, water and drain penetrations through Walk-in Freezer box panels, must be located, executed and sealed both sides of box by the Walk-in Freezer box installer in accordance with Walk-in Freezer panel manufacturer instructions. Seal inside of electrical conduit once wires have been pulled.
 - .5 In parallel to installation of penetrating items by other trades, these items must be insulated and sealed in accordance with Walk-in Freezer panel manufacturer's instructions.
 - .6 Holes on exposed faces of sectional panels shall be covered with 1.0mm thick stainless steel escutcheon plate.
 - .7 Sprinkler pipe penetrations: refer also to Section 21 13 13 – Fire Suppression Sprinkler for sprinkler installation including

requirement for sprinkler boots.

2.2 COLD ROOM

- .1 Doors, Frames and Hardware:
 - .1 General:
 - .1 Retrofit prefabricated insulated cold room type for installation in masonry partition types indicated.
 - .2 Frame:
 - .1 Part of door assembly, composed of:
 - .1 Front frame: 0.635mm (24 gauge), no. 304 stainless steel, 2B finish.
 - .2 Inside jamb: 0.635mm (24 gauge), no. 304 stainless steel, 2B finish.
 - .3 Back frame: 0.635mm (24 gauge), no. 304 stainless steel, 2B finish.
 - .3 Reinforcement:
 - .1 Provide heavy duty steel reinforcement for hinges and other hardware items as required.
 - .1 All door hardware to be attached to large 12 mm thick, non-conducting synthetic tapping plates.
 - .4 Door: (hinges type)
 - .1 Flush-mounted, in-fitting, with swing and size as indicated.
 - .2 Designed and certified for Cold applications.
 - .3 Polyurethane insulated with stainless steel pans. Insulation type and thickness and steel pans to match wall panels as per indications.
 - .4 Door shall be constructed to incorporate a heavy-duty, molded thermal break strip permanently foamed-in-place.
 - .5 Accessories:
 - .1 Gaskets: (top and two sides)
 - .1 Soft thermoplastic gasket with magnetic steel core.
 - .2 Oil, fat, water and sunlight resistant.
 - .3 Capable of being easily replaced.
 - .2 Bottom seal:
 - .1 Adjustable rubber wiper gasket and mounting angle at door bottom.
 - .2 Capable of being easily replaced.
 - .3 Door light assembly.
 - .1 LED.
 - .4 Protection plates: (at exterior and interior door faces)
 - .1 Stainless steel type 304 with 2B finish, 1.2mm (18 gauge) x 1220 mm high.
 - .5 Conduit for inner wiring of door panel must be concealed in the polyurethane foam panel. Door section to be field wired to surface-mounted 100 mm x 100 mm junction box on the interior door panel. The complete door section shall be UL listed and CSA certified and labeled thus.
 - .5 Door Hardware:

- .1 Hinges: (three per door)
 - .1 Self-closing heavy-duty corrosion-resistant cam-rise hinge, precision-machined stainless steel cams to gently raise and lower door.
 - .2 Stainless steel flange, 5mm thick strap, 16mm diameter cam pins, drilled for 10mm screws.
 - .3 Strap length and offset to suit load rating (door width, door weight and other conditions) as required to maximize performance, strap length minimum 710 mm.
 - .4 Acceptable material: Kason Series 1377L Heavy Duty Cam-Rise Stainless Steel Self-closing Hinge or approved equal.
- .2 Latch with Inside Release:
 - .1 Stainless steel corrosion-resistant latch to match hinges with padlocking provision and stainless steel rod and flange inside release, glow-in-the-dark plastic knob; size to suit door panel.
 - .2 Stainless steel inside release to open padlocked latch from inside the Cold Room.
 - .1 Padlock to be on Cold Room side.
 - .3 Material: stainless steel #316 body and strike housing with #304 stainless steel roller.
 - .4 Mounting: holes drilled for fasteners recommended by manufacturer.
 - .5 Tamper resistant locking mechanism and mounting built-in.
 - .6 Roller strike to assure precise adjustment.
 - .7 Acceptable material: Kason 778 Stainless steel Safeguard Latch and 481SC Stainless Steel Inside Release or approved equal.
- .3 Door Closer/Assisted Latching Device:
 - .1 Spring action stainless steel closer, mounting plate and bend-resistant hook with polymer roller; offset to suit.
 - .2 Operation: operates by direct force adding to natural swing momentum. Designed to overcome slowing action of gaskets and air pressure. Provides fast, full closure for heavy walk-in doors.
 - .3 Acceptable material: Kason 1095 Spring Action Door Closer or approved equal.
- .2 Rub-rail wall protectors: (at Cold Room wall as indicated)
 - .1 Hat shaped 50 x 150 x 50 with 50 mm projection, 1.6 mm (16 gauge) #304, fastened to walk-in with #10 x 50 mm stainless steel screws through pre-punched holes in top and bottom flanges.
 - .2 Mitre joint and weld.
 - .3 Box open ends.
 - .4 Top and vertical ends where rail makes contact with wall panels are to be sealed. Seal in accordance with Walk-in Freezer panel manufacturer.

2.3 SAFETY SIGNAGE

- .1 Safety signage:
 - .1 Safeguard latch signs: sign to indicate that the door is equipped with a safeguard latch and describing operations required to exit.
 - .1 Locate near safety release at interior of Walk-in Freezer and Cold Room doors.
 - .2 Floor surface sign: sign to indicate caution, floor surface may become slippery, use caution when entering and exiting, wear non-skid shoes, floor surface should be kept clean and dry.
 - .1 Locate at exterior of Walk-in Freezer No.1, Walk-in Freezer No.2 and Cold Room doors.

2.4 ISOLATION COATING

- .1 Isolation coating: (stainless steel to concrete)
 - .1 Type recommended by Walk-in Freezer panel manufacturer to protect Freezer floor panel from corrosion at radiant floor heating overlay.
- .2 Isolation coating: (stainless steel to other metals)
 - .1 Type recommended by Walk-in Freezer panel manufacturer to protect from corrosion.

2.5 SEALANT

- .1 Walk-in Freezer box panel to panel joints:
 - .1 Sealant selection is fully the responsibility of the Walk-in Freezer box manufacturer.
 - .2 CFIA (Canadian Food Inspection Agency) approved.
- .2 Top of perimeter angle at radiant floor heating:
 - .1 Between top of perimeter angle at radiant floor heating system to Walk-in Freezer box floor panel.
 - .2 Two-component urethane sealant system, non-flammable, non-sag, fast cure, chemically resistant. When fully cured, produces a hard, strong smooth joint.
 - .1 Properties:
 - .1 Solids: 100%.
 - .2 Flashpoint: >93 degrees C.
 - .3 Waterproof.
 - .4 Resistant against caustic cleaning agents.
 - .2 CFIA (Canadian Food Inspection Agency) approved.
 - .3 Acceptable Material: Crane Composites, Cleanroom Wall System Seam Sealant R53827 or approved equal, colour to be selected from full range.
- .3 Walk-in Freezer box panel service penetrations:
 - .1 Sealant selection is fully the responsibility of Walk-in Freezer box manufacturer at penetrations for conduits, piping etc. to accommodate electrical wiring conduits, refrigeration piping, water and drain penetrations through Walk-in Freezer box panel.
 - .2 CFIA (Canadian Food Inspection Agency) approved.

2.6 REFRIGERATION SYSTEMS: .1
(EQUIPMENT FOR REMOTE
INSTALLATION)

Materials Refrigeration Systems – General:

- .1 Provide completely integrated operational refrigeration system.
- .2 Manufacturer shall be one who stocks products locally and who maintains an inventory of replacement units and repair parts within the geographical location of this project.
- .3 Provide separate refrigeration systems for each Walk-in Freezer and for the Cold Room.
- .4 Utilize R-404A refrigerant.

.2 Refrigeration Systems Equipment: Condensing Units, Evaporators and Compressors - general

- .1 The size rating and capacity indicated below are provided for information only and must be confirmed by the Contractor. Contractor is responsible for refrigeration calculations and electrical calculations.
- .2 Condensing units must be of adequate capacity to achieve and maintain the individual room operating temperature requirements indicated and must be sized to handle additional loads appropriate to the application. Units are to be complete in all respects. Units are to be located as indicated.
- .3 Condensing units and evaporator coils to be from same manufacturer and be ULC listed.
- .4 Evaporator blower coils shall meet A.R.A. code regulations and be complete with suction lines and heat exchangers.
- .5 Compressors to include equipment stands, vibrasorber connector and mounting pads.
- .6 Electrical disconnect switch to be provided at each compressor, evaporator and condensing unit, installed by the electrical contractor.

.3 Refrigeration Systems Accessories:

- .1 Medium temperature system for Cold Room shall include the following accessories furnished and installed:
 - .1 Thermostat expansion valves shall have replaceable temperature rated elements so as to provide peak performance and close control for each specific application:
 - .2 Dual pressure control;
 - .3 Contactor - mounted and inter-wired;
 - .4 Filter drier unit shall be the moulded solid core type containing a crystalline form of activated aluminum and a molecular sieve for the elimination of water and acid from the system;
 - .5 Liquid and moisture indicator complete with a plastic protector cap;
 - .6 Thermostat control;
 - .7 Vibrasorber connector and mounting pads for the condensers;
 - .8 Refrigerant solenoid valve complete with a replaceable moulded coil at the evaporator blower coil.
 - .9 See below for additional details and requirements.
- .2 Low temperature systems for Walk-in Freezer boxes shall include the following accessories furnished and installed:

- .1 Defrost timer and control kit;
 - .2 Dual pressure control;
 - .3 Thermostat control
 - .4 Thermostat expansion valve which shall have a replaceable temperature rated element so as to provide peak performance and close control for each specific application;
 - .5 Filter drier unit shall be the moulded solid core type containing a crystalline form of activated aluminum and a molecular sieve for the elimination of water and acid from the system;
 - .6 Liquid and moisture indicator complete with a plastic protection cap;
 - .7 Refrigerant solenoid valve complete with a moulded coil at the evaporator blower coil;
 - .8 Crank-case pressure regulator;
 - .9 Contactor - mounted and inter-wired;
 - .10 Accumulator control;
 - .11 Evaporator blower coil drain line heater cable shall be the type which internally controls its own heat output along the entire length;
 - .12 Vibrasorber connector and isolation mounting pads at the condenser.
 - .13 See below for additional details and requirements.
- .4 Refrigerant Lines:
- .1 Refer to Section 23 23 00 - Refrigerant Piping.
- .5 Condensate Drain Lines:
- .1 Refer to section 22 13 17 – Plumbing-Drainage waste and vent piping.
 - .2 Refer to section 23 05 33 - Heat Tracing For HVAC Piping And Tanks
 - .3 Freezer drain lines to be copper tubing complete with individual traps, sloped and run to drain, insulated and heat traced inside Walk-in Freezer and extending a distance of 305mm beyond Walk-in Freezer wall panel.
- .6 Insulated Jacketing System:
- .1 Refer to Section 23 05 05 - Installation Of Pipework
- .7 Nameplates:
- .1 Refer to specification Section 10 14 00 – Signage for supply and install of lamacoid plates.
- .8 Equipment Schedule:
- .1 General: load calculations and related specific equipment selections indicated are preliminary and are to be confirmed by the Contractor. Refer to Submittal requirements in Part 1 of this Section.
 - .2 **Walk-in Freezer No.1:**
 - .1 Box size: as indicated
 - .2 Performance:
 - .1 Cooling requirements, internal temperature: -25°C (-13°F).
 - .2 System Balance – System Capacity: 5.1KW

- (17399 BTUH).
- .3 **Compressor Unit: (serving Walk-in Freezer No.1)**
- .1 Remote semi hermetic compressor.
- .1 Acceptable material: Keeprite, model KR350L6-IT3A or approved equal meeting specifications noted below.
- .2 Description:
- .1 Voltage: 208-230/3/60.
- .2 System refrigerant: R404A.
- .3 Power: 2.6 kW (3.5 Hp).
- .4 Suction temp: -30°C (-23°F).
- .5 Amps: 16.8.
- .6 Ampacity overcurrent protection.
- .7 Liquid piping: 12.5 mm (1").
- .8 Suction: 35 mm (1-3/8").
- .9 Weight: 205 kg (533 lbs)
- .3 Features:
- .1 Adjustable dual high/low pressure control.
- .2 Compressor head cooling fans.
- .3 Copper tubing secured with cushion clamps.
- .4 Discharge vibration eliminator.
- .5 Flexible hose on all compressor pressure control connections.
- .6 Oil failure control.
- .7 Receiver with fusible plug and liquid shutoff valve.
- .8 Sealed liquid line filter drier and sight glass.
- .9 Spring mounted, accessible semi-hermetic compressor.
- .10 Heavy-duty electrical control box with compressor contactor and fused control circuit.
- .11 Suction and discharge service valves.
- .4 Required Options:
- .1 Adjustable pressure controls:
- .1 Acceptable material: Johnson Dual with flex hose or approved equal.
- .2 Capacity control - hot gas bypass:
- .1 Crankcase pressure regulator.
- .2 Discharge line check valve.
- .3 Discharge muffler: discharge gas pulsation damper designed to reduce noise and vibration on compressor discharge line, sweat connections to have corrosion resistant finish.
- .3 Disconnect switch:
- .1 Non-fused.
- .4 Liquid line filter drier and sight glass:
- .1 Sealed and replaceable.

- .2 Acceptable material: Sporlan or approved equal.
 - .5 Phase/voltage monitor:
 - .1 Receiver inlet valve (Rotolok).
 - .2 Single point electrical: Power for the evaporators is supplied from the condensing unit. Electrical data plate located on condensing unit electrical panel door will display accurate amperage loads of the fans /heaters within the evaporators. Total MCA and MOP will reflect the amperage of the condensing unit and the evaporators.
 - .6 Suction accumulator:
 - .1 With heat exchanger.
 - .2 Vertical welded steel shell, powder coat finish.
 - .7 Suction filter:
 - .1 Acceptable material: Sporlan RSF or approved equal.
 - .2 Replaceable core, with access valve and bypass pressure relief, epoxy powder coating, ODF pipe connections.
 - .3 Hot gas defrost system, acceptable material: Thermosaver or approved equal.
 - .4 Hot gas components, acceptable material: Thermosaver or approved equal.
 - .8 Time clock:
 - .1 Acceptable material: Paragon 8145 style, or approved equal.
 - .1 Defrost timer is time initiated, temperature or pressure terminated with a timed, failsafe, factory installed and wired in the condensing unit electrical panel.
 - .2 Two valve adjustable flooded head pressure control, pressure differential valve.
- .4 **Evaporator: (serving Walk-in Freezer No.1)**
 - .1 Low profile evaporator.
 - .1 Acceptable material: Keeprite, model

- KLP422LT-S2B T-SAVER, or approved equal meeting specifications noted below.
- .2 Description:
- .1 Voltage: 208-230/1/60.
 - .2 System refrigerant: R404A.
 - .3 Air flow: 1698 l/sec (3600 cfm).
 - .4 Evap temp: -30°C (-21°F).
 - .5 Box temp: -25°C (-13°F).
 - .6 Capacity: 5.1 kW (17399 BTUH).
 - .7 Fans:
 - .1 Quantity: 4.
 - .2 Power: 51 watts (0.07Hp).
 - .3 FLA/Fan: 0.5
 - .4 Amps: 2, 400 watts.
 - .8 Drain pan heaters: 3.1 amps, 720 watts.
 - .9 Total amps: 5.1
 - .10 Ampacity overcurrent protection.
 - .11 Distributor: 22 mm (7/8").
 - .12 Suction: 22 mm (7/8").
 - .13 Weight: 61 kg (134 lbs)
- .3 Features:
- .1 9 mm (3/8") tubing coil construction, to reduce refrigerant operating charge.
 - .2 Factory installed solenoid valve wire harness.
 - .3 Heavy gauge textured aluminium cabinet construction.
 - .4 High efficiency PSC fan motor with internal overload protection.
 - .5 Spacious piping end compartment allowing for easy assembly.
 - .6 Hinged drain pan with central universal drain connection (19 mm drain).
 - .7 Front access with spacious electrical and header compartments.
 - .8 Schrader connection on suction header.
 - .9 Durable high density polyethelene fan guards.
 - .10 High efficiency enhanced copper tube and aluminium fin coil design.
 - .11 6 fins per 25.4mm.
- .4 Required Options:
- .1 Hot gas defrost.
 - .1 Acceptable material: Thermosaver or approved equal.
 - .2 Tamper proof screws, pinhead Torx.
 - .3 Insulated drain pan:
 - .1 Moisture resistant insulation, between inner drain pan and exterior skin.

- .4 Room thermostat:
 - .1 Located inside with remote bulb.
 - .2 Acceptable material: Johnson A19ABC or approved equal.
 - .5 **Condenser: (serving Walk-in Freezer No.1 and No.2)**
 - .1 See below.
- .3 **Walk-in Freezer No.2:**
 - .1 Box size: as indicated
 - .2 Performance:
 - .1 Cooling requirements, internal temperature: -25°C.
 - .2 System balance – System Capacity: 4.8 W (16381 BTUH).
 - .3 **Compressor: (serving Walk-in Freezer No.2)**
 - .1 Remote semi hermetic compressor.
 - .1 Acceptable material: Keeprite, model KR350L6-IT3A, or approved equal meeting specifications noted below.
 - .2 Description:
 - .1 Voltage: 208-230/3/60.
 - .2 System refrigerant: R404A.
 - .3 Power: 2.6 kW (3.5 Hp).
 - .4 Suction temp: -31.6°C (-24.9°F).
 - .5 Amps: 16.8.
 - .6 Ampacity overcurrent protection.
 - .7 Liquid piping: 12.5 mm (1").
 - .8 Suction: 35 mm (1-3/8").
 - .9 Weight: 205 kg (533 lbs).
 - .3 Features:
 - .1 Adjustable dual high/low pressure control.
 - .2 Compressor head cooling fans.
 - .3 Copper tubing secured with cushion clamps.
 - .4 Discharge vibration eliminator.
 - .5 Flexible hose on all compressor pressure control connections.
 - .6 Oil failure control.
 - .7 Receiver with fusible plug and liquid shutoff valve.
 - .8 Sealed liquid line filter drier and sight glass.
 - .9 Spring mounted, accessible semi-hermetic compressor.
 - .10 Heavy-duty electrical control box with compressor contactor and fused control circuit.
 - .11 Suction and discharge service valves.
 - .4 Required Options:
 - .1 Adjustable pressure controls:
 - .1 Acceptable material: Johnson Dual with flex hose or approved equal.

- .2 Capacity control hot gas bypass:
 - .1 Crankcase pressure regulator.
 - .2 Discharge line check valve.
 - .3 Discharge muffler, discharge gas pulsation damper designed to reduce noise and vibration on compressor discharge line, sweat connections to have corrosion resistant finish.
- .3 Disconnect switch:
 - .1 Non-fused.
- .4 Liquid line filter drier and sight glass:
 - .1 Sealed and replaceable.
 - .2 Acceptable material: Sporlan or approved equal.
- .5 Phase/voltage monitor:
 - .1 Receiver inlet valve (Rotolok).
 - .2 Single point electrical: Power for the evaporators is supplied from the condensing unit. Electrical data plate located on condensing unit electrical panel door will display accurate amperage loads of the fans /heaters within the evaporators. Total MCA and MOP will reflect the amperage of the condensing unit and the evaporators.
- .6 Suction accumulator:
 - .1 With heat exchanger.
 - .2 Vertical welded steel shell, powder coat finish.
- .7 Suction filter:
 - .1 Acceptable material: Sporlan RSF or approved equal.
 - .2 Replaceable core, with access valve and bypass pressure relief, epoxy powder coating, ODF pipe connections.
 - .3 Hot gas defrost system, acceptable material: Thermosaver or approved equal.
 - .4 Hot gas components, acceptable material: Thermosaver or approved equal.
- .8 Time clock:
 - .1 Acceptable material: Paragon 8145 style, or approved equal.

- .1 Defrost timer is time initiated, temperature or pressure terminated with a timed, failsafe, factory installed and wired in the condensing unit electrical panel.
- .2 Two valve adjustable flooded head pressure control.
- .4 **Evaporator: (serving Walk-in Freezer No.2)**
 - .1 Low profile evaporator.
 - .1 Acceptable material: Keeprite, model KLP317LT-S2B T-SAVER, or approved equal meeting specifications noted below.
 - .2 Description:
 - .1 Voltage: 208-230/1/60.
 - .2 System refrigerant: R404A.
 - .3 Air flow: 1274 l/sec (2700 cfm).
 - .4 Evap temp: -30°C (-22.9°F).
 - .5 Box temp: -25°C (-13°F).
 - .6 Capacity: 4.8.1 kW (16381 BTUH).
 - .7 Fans:
 - .1 Quantity: 3.
 - .2 Power: 52 watts (0.07Hp).
 - .3 FLA/Fan: 0.5.
 - .4 Amps: 1.5, 300 watts.
 - .8 Drain pan heaters: 2.4 amps, 560 watts.
 - .9 Total amps: 3.9.
 - .10 Ampacity overcurrent protection.
 - .11 Distributor: 12.5 mm (1/2").
 - .12 Suction: 22 mm (7/8").
 - .13 Weight: 48 kg (106 lbs)
 - .3 Features:
 - .1 9 mm (3/8") tubing coil construction, to reduce refrigerant operating charge.
 - .2 Factory installed solenoid valve wire harness.
 - .3 Heavy gauge textured aluminium cabinet construction.
 - .4 High efficiency PSC fan motor with internal overload protection.
 - .5 Spacious piping end compartment allowing for easy assembly.
 - .6 Hinged drain pan with central universal drain connection (19 mm drain).
 - .7 Front access with spacious electrical and header compartments.
 - .8 Schrader connection on suction header.
 - .9 Durable high density polyethelene fan

- guards.
- .10 High efficiency enhanced copper tube and aluminium fin coil design.
- .11 6 fins per 25.4mm.
- .4 Required Options:
 - .1 Hot gas defrost.
 - .1 Acceptable material: Thermosaver or approved equal.
 - .2 Tamper proof screws, pinhead Torx.
 - .3 Insulated drain pan:
 - .1 Moisture resistant insulation, between inner drain pan and exterior skin.
 - .4 Room thermostat:
 - .1 Located inside with remote bulb.
 - .2 Acceptable material: Johnson A19ABC or approved equal.
- .5 **Condenser: (serving Walk-in Freezers)**
 - .1 See below.
- .4 **Cold Room:**
 - .1 Room size: as indicated. Note: the Cold Room is not a "box".
 - .2 Performance:
 - .1 Cooling requirements, internal temperature: 1.66°C.
 - .2 System Balance – System Capacity: 11.6 kW (39453 BTUH).
 - .3 **Compressor: (serving Cold Room)**
 - .1 Remote semi hermetic compressor.
 - .1 Acceptable material: Keeprite, model KR500M8-IT3A, or approved equal meeting specifications noted below.
 - .2 Description:
 - .1 Voltage: 208-230/3/60.
 - .2 System refrigerant: R404A.
 - .3 Power: 3.68 kW (5Hp).
 - .4 Suction temp: -5°C (22.9°F).
 - .5 Amps: 22.3.
 - .6 Ampacity overcurrent protection.
 - .7 Liquid piping: 16 mm (5/8").
 - .8 Suction: 35 mm (1-3/8").
 - .9 Weight: 236kg (5211lbs)
 - .3 Features:
 - .1 Adjustable dual high/low pressure control.
 - .2 Copper tubing secured with cushion clamps.
 - .3 Discharge vibration eliminator.
 - .4 Flexible hose on all compressor pressure control connections.
 - .5 Oil failure control.
 - .6 Receiver with fusible plug and liquid shutoff valve.

- .7 Sealed liquid line filter drier and sight glass.
- .8 Spring mounted, accessible semi-hermetic compressor.
- .9 Heavy-duty electrical control box with compressor contactor and fused control circuit.
- .10 Suction and discharge service valves.
- .4 Required Options:
 - .1 Adjustable pressure controls:
 - .1 Acceptable material: Johnson Dual with flex hose or approved equal.
 - .2 Capacity control hot gas bypass:
 - .1 Crankcase pressure regulator.
 - .2 Discharge line check valve.
 - .3 Discharge muffler, discharge gas pulsation damper designed to reduce noise and vibration on compressor discharge line, sweat connections to have corrosion resistant finish.
 - .3 Disconnect switch:
 - .1 Non-fused.
 - .4 Liquid line filter drier and sight glass:
 - .1 Sealed and replaceable.
 - .2 Acceptable material: Sporlan or approved equal.
 - .5 Phase/voltage monitor:
 - .1 Receiver inlet valve (Rotolok).
 - .2 Single point electrical: Power for the evaporators is supplied from the condensing unit. Electrical data plate located on condensing unit electrical panel door will display accurate amperage loads of the fans /heaters within the evaporators. Total MCA and MOP will reflect the amperage of the condensing unit and the evaporators.
 - .6 Suction accumulator:
 - .1 With heat exchanger.
 - .2 Vertical welded steel shell, powder coat finish.
 - .7 Suction filter:
 - .1 Acceptable material: Sporlan RSF type or approved equal.
 - .2 Replaceable core, with access valve and bypass pressure relief, epoxy powder coating, ODF pipe

- connections.
- .3 Hot gas defrost system,
acceptable material:
Thermosaver or approved
equal.
- .4 Hot gas components,
acceptable material:
Thermosaver or approved
equal.
- .8 Time clock:
 - .1 Acceptable material:
Paragon 8145 style, or
approved equal.
 - .1 Defrost timer is time
initiated, temperature
or pressure
terminated with a
timed, failsafe,
factory installed and
wired in the
condensing unit
electrical panel.
 - .2 Two valve adjustable flooded
head pressure control.
- .4 **Evaporator: (serving Cold Room)**
 - .1 Low profile evaporator.
 - .1 Acceptable material: Keeprite, model
KLP639MT-S2B T-SAVER, or
approved equal meeting
specifications noted below.
 - .2 Description:
 - .1 Voltage: 208-230/1/60.
 - .2 System refrigerant: R404A.
 - .3 Air flow: 2547 l/sec (5400 cfm).
 - .4 Evap temp: -4°C (29.4°F).
 - .5 Box temp: 1.7°C (35°F).
 - .6 Capacity: 11.56 kW (39453 BTUH).
 - .7 Fans:
 - .1 Quantity: 6.
 - .2 Power: 51.5 watts (0.07Hp).
 - .3 FLA/Fan: 0.5.
 - .4 Amps: 3, 600 watts.
 - .8 Drain pan heaters: 4 amps, 1030
watts.
 - .9 Total amps: 7.
 - .10 Ampacity overcurrent protection.
 - .11 Distributor: 22 mm (7/8").
 - .12 Suction: 35 mm (1-3/8").
 - .13 Weight: 87 kg (192 lbs)
 - .3 Features:
 - .1 9 mm (3/8") tubing coil construction,
to reduce refrigerant operating
charge.
 - .2 Factory installed solenoid valve wire
harness.
 - .3 Heavy gauge textured aluminium

- cabinet construction.
- .4 High efficiency PSC fan motor with internal overload protection.
- .5 Spacious piping end compartment allowing for easy assembly.
- .6 Hinged drain pan with central universal drain connection (19 mm drain).
- .7 Front access with spacious electrical and header compartments.
- .8 Schrader connection on suction header.
- .9 Durable high density polyethylene fan guards.
- .10 High efficiency enhanced copper tube and aluminium fin coil design.
- .11 6 fins per 25.4 mm.
- .4 Required Options:
 - .1 Hot gas defrost:
 - .1 Acceptable material: Thermosaver or approved equal.
 - .2 Tamper proof screws, pinhead Torx.
 - .3 Insulated drain pan:
 - .1 Moisture resistant insulation, between inner drain pan and exterior skin.
 - .4 Room thermostat:
 - .1 Located inside with remote bulb.
 - .2 Acceptable material: Johnson A19 or approved equal.
- .5 **Condenser (serving Cold Room):**
 - .1 See below.
- .5 **Condensers:**
 - .1 **Condenser (serving Walk-in Freezer No.1 and No.2):**
 - .1 Medium air-cooled condenser.
 - .1 Acceptable material: Keeprite, model KCM013-T3A-AV, or approved equal meeting specifications noted below.
 - .2 Description:
 - .1 Model information:
 - .1 Voltage: 208-230/3/60.
 - .2 Orientation: vertical.
 - .3 Motor type: 1075 rpm.
 - .4 Fans long: 2.
 - .5 Fans wide: 1
 - .6 Rating: 6216 BTUH/F°.TD.
 - .7 Feeds available: 10.
 - .8 Total heat rejected: 15.94 kW (54407 BTUH).
 - .2 Air flow: 6981 l/sec (14800 cfm).
 - .3 Quantity: 2.
 - .4 Power: 552 watts (0.75Hp).

- .5 FLA/FAN: 2.3.
- .6 Amps: 4.6.
- .7 Ampacity overcurrent protection.
- .8 Liquid piping: 28 mm (1-1/8").
- .9 Weight: 186kg (410lbs).
- .3 Features:
 - .1 High efficiency copper tube and aluminium fin coil design.
 - .2 Coil design feature to eliminate tube failure on tube sheets.
 - .3 Fan motors inherently protected with internal overloads.
 - .4 Heavy gauge galvanized steel cabinet construction.
 - .5 Energy efficient PSC and 3 phase fan motors with overload protection.
 - .6 Zinc plated huck bolts.
 - .7 Heavy duty 610 mm legs.
 - .8 Unit shipped with nitrogen holding charge.
 - .9 8 fins per 25.4mm.
- .4 Required Options:
 - .1 Design data:
 - .1 230V control circuit.
 - .2 Fan cycling:
 - .1 Ambient individual.
 - .3 Individual fan motor fusing.
 - .4 Individual motor contactor.
 - .5 Additional circuits.
 - .1 One circuit for each Freezer.
 - .6 Fused disconnect (manual option).
 - .7 Variable speed fan on lead motor:
 - .1 Single 3/4Hp EC motor with speed controller.
 - .1 Acceptable material; EC motor with Johnson controller, or approved equal.
- .5 Load Connections:
 - .1 Circuit 1: (for Walk-in Freezer No.2)
 - .1 Saturated Suction Temperature: -32°C (-24.9°F)
 - .2 Saturated condensing temperature: 41°C (105°F).
 - .3 Comp BTUH: 16381.
 - .4 Refrigerant: R404A.
 - .5 Design of TD °F: 10.
 - .6 THR BTUH: 26193.
 - .7 THR BTUH/°F.TD: 2619.
 - .8 Number of feeds: 5.
 - .9 Feeds: 1 to 5.
 - .10 Actual Condensing Temperature: 40°C (103.4°F).
 - .11 TD: -13°C (8.43°F).

- .2 Circuit 2: (for Walk-in Freezer No.1)
 - .1 Saturated Suction
Temperature: -31°C (-23°F)
 - .2 Saturated Condensing
Temperature: 41°C (105°F).
 - .3 Comp BTUH: 17399.
 - .4 Refrigerant: R404A.
 - .5 Design of TD °F: 10.
 - .6 THR BTUH: 27490.
 - .7 THR BTUH/°F.TD: 2749.
 - .8 Number of feeds: 5.
 - .9 Feeds: 6 to 10.
 - .10 Actual Condensing
Temperature: 40°C
(103.8°F).
 - .11 TD: -13°C (8.8°F).
- .2 **Condenser (serving Cold Room):**
 - .1 Small air-cooled condenser.
 - .1 Acceptable material: Keeprite, model KCS006-S2A-AV, or approved equal meeting specifications noted below.
 - .2 Description:
 - .1 Model information:
 - .1 Voltage: 208-230/1/60.
 - .2 Orientation: vertical.
 - .3 Motor type: 1075 rpm.
 - .4 Fans long: 1.
 - .5 Fans wide: 1
 - .6 Rating: 3050 BTUH/F°.TD.
 - .7 Feeds available: 4.
 - .8 Total heat rejected: 15.31 kW
(52236 BTUH).
 - .2 Air flow: 1924.62 l/sec (4080.2 cfm).
 - .3 Quantity: 1.
 - .4 Power: 242.88 watts (0.33 Hp).
 - .5 FLA/FAN: 2.1.
 - .6 Amps: 2.1.
 - .7 Watts: 410.
 - .8 Ampacity overcurrent protection.
 - .9 Liquid piping: 16 mm (5/8").
 - .10 Weight: 71 kg (157lbs).
 - .3 Features:
 - .1 High efficiency copper tube and aluminium fin coil design.
 - .2 Fan guard.
 - .3 Fan motors inherently protected with internal overloads.
 - .4 High efficiency PSC fan motor with overload protection.
 - .5 Outdoor weather-resistant housing, G90 galvanized steel.
 - .6 Coil design feature to eliminate tube failure on tube sheets.
 - .7 Horizontal and vertical air discharge.
 - .8 Heavy gauge galvanized steel cabinet construction.

- .9 Zinc plated huck bolts.
- .10 Heavy duty 610 mm legs.
- .11 Unit shipped with nitrogen holding charge.
- .4 Required Options:
 - .1 Design data:
 - .1 230V control circuit.
 - .2 Individual fan motor fusing.
 - .3 Leg kit: (field install)
 - .1 Vertical air discharge.
 - .4 Fused disconnect (manual option).
- .5 Load Connections:
 - .1 Circuit 1: (Cold Room)
 - .1 Saturated Suction
Temperature: -30°C (22.9°F)
 - .2 Saturated condensing
temperature: 46°C (115°F).
 - .3 Comp BTUH: 39453.
 - .4 Refrigerant: R404A
 - .5 Design of TD °F: 20.
 - .6 THR BTUH: 52689.
 - .7 THR BTUH/°F.TD: 2634.
 - .8 Number of feeds: 4.
 - .9 Feeds: 1 to 4.
 - .10 Actual Condensing
Temperature: 44.5°C
(112.1°F).
 - .11 TD: -8.3°C (17.1°F).

2.7 MODES OF OPERATION

- .1 Refrigeration Cycle:
 - .1 As box temperature rises, the room thermostat energizes the liquid line solenoid valve.
 - .2 This allows refrigerant to enter the evaporator, build up pressure, cause the low pressure control (dual hi/lo pressure control) to energize the compressor contactor and start the compressor.
 - .3 The compressor's hot discharge gas is piped out to the condenser through the de-energized 3-way hot gas solenoid valve.
 - .4 Hot gases directed through the heat exchanger for the under floor radiant heating system that heats up the glycol circuit. Refer to Section 23 83 16 – Radiant Floor Heating.
 - .5 The hot refrigerant gas is condensed by the condenser.
 - .6 The liquid then flows to the receiver through the opened liquid line check valve and on through the coiled liquid line within the suction accumulator. This performs the function as a suction-to-liquid heat-exchanger.
 - .7 The sub-cooled liquid then flows through the liquid line solenoid valve (energized open) and on to the thermostatic expansion valve.
 - .8 The refrigerant is then directed through the distributor at a lower pressure and flows into the evaporator.
 - .9 The refrigerant liquid/vapour mixture is then boiled by the warmer box air from the evaporator fan.

- .10 The refrigerant vapour then flows through a defrost regulating valve preventing a motor overload from high suction pressures and enters the suction accumulator and on to the compressor.
- .2 Defrost Cycle:
 - .1 The timeclock de-energizes (closes) the liquid line solenoid valve which causes the compressor to pump-down and shut off from low pressure control.
 - .2 The timeclock also energizes the drain pan heater in the evaporator and timer relay which, after a two or more minute delay, energizes (opens) the 3-way valve and hot gas solenoid valve which then builds up pressure in the evaporator causing the low pressure to close and start the compressor.
 - .3 The hot discharge gas from the compressor flows through the 3-way valve forcing all the liquid left in the liquid line into the evaporator.
 - .4 If pressure builds up too high, the 3-way high pressure safety control will de-energize the solenoid valve and allow pressure to relieve through the condenser.
 - .5 Pressures within the evaporator will increase during the defrost. The outlet pressure regulator maintains a desired pressure differential in the system, as well as reducing the amount of liquid refrigerant back to the accumulator. The regulator also minimizes any high suction pressure avoiding compressor motor overloads.
 - .6 Once all the frost has melted, the pressure will continue to rise until the defrost termination pressure control energizes the timeclock's internal solenoid, terminating the defrost cycle.
 - .7 The 3-way valve and hot gas valve solenoids are then de-energized.
 - .8 Prior to resuming the refrigeration cycle, a drip timer provides an extended drain off time (approx. 5 minutes) for the condensate to drain away from the evaporator fins and pan.
 - .9 After this time has elapsed the liquid line solenoid valve opens and the compressor continues to run.
 - .10 The evaporator fans do not start up until the pressure in the evaporator is low enough to close the fan delay pressure control.
 - .11 By delaying the fans, this allows any moisture left on the coil to drain away or freeze.
 - .12 As soon as the evaporator fans are energized, the system will then resume back to the refrigeration cycle.
 - .13 The cycle continues until the room temperature is satisfied.
 - .14 This de-energizes the liquid line solenoid, initiating a pump-down cycle that reduces the suction pressure to the cut-out setting on the low pressure control which de-energizes the compressor.

PART 3 - EXECUTION

3.1 GENERAL

- .1 Provide manufacturer representatives' services indicated.

- .2 Provide all labour, materials, tools, delivery, assembly and set-in place as necessary for the supply and installation of fully functional systems in accordance with contract documents and applicable codes and by-laws. Final connection by Mechanical and Electrical trades. Clean, test, commission and demonstrate equipment following installation completion.
- .3 Installation and start-up shall be carried out by a competent supervisor on site at all times throughout installation, in conjunction with journeyman workers, qualified refrigeration mechanics.
- .4 Coordinate work to be performed by other trades in connection with requirements for all equipment under this Section.
- .5 Provide all inserts, anchors, sleeves, bolts and similar items required to be attached to building components to provide proper anchorage of equipment. Provide all necessary templates, instructions, directions and coordination of such items.
- .6 Install in accordance with all applicable codes, ordinances and by-laws.
- .7 Install in accordance with manufacturer's written instructions and reviewed shop drawings.
- .8 Do all work as required for complete refrigeration and equipment systems.
- .9 Coordinate with Section 23 83 16 – Radiant Floor Heating for box Freezer under-floor radiant heating system which is required in order to prevent migration of freezing condition in concrete sub-floor.
- .10 Verify all roughing-in locations and capacities for service connections are as required for the proper completion and operation of work.

3.2 DE-COMMISSIONING AND DEMOLITIONS

- .1 Decommissioning and demolitions to be undertaken in coordination with:
 - .1 Mould abatement requirements indicated. Refer to Section 02 85 00.03 – Mould Remediation – Maximum Precautions, Owner constraints indicated and approved construction phasing plan. Refer to Section 01 14 00 – Work Restrictions for construction phasing requirements – general intent.
- .2 Existing Cold Room:
 - .1 De-commission in accordance with owner constraints and reviewed and approved construction phasing plan.
 - .2 Demolish refrigeration equipment, accessories and door serving Cold Room.
 - .1 Pump down refrigeration circuits.
 - .2 Reclaim refrigerant gases as per MOPIA and applicable Federal Government standards.
- .3 Existing Walk-in Freezer:
 - .1 Interim requirement: temporary relocation of compressor to suit phasing requirements:

- .1 Pump down refrigeration circuits.
- .2 Reclaim refrigerant gases as per MOPIA and applicable Federal Government standards.
- .3 Extend existing Freezer liquid and suction lines from existing Compressor Room to new location as indicated.
- .4 Installation, insulation and brazing as per new construction specifications and industry standards.
- .5 Purge lines with nitrogen as per new construction specifications.
- .6 Recharge and balance existing Freezer refrigeration circuit.
- .7 Contractor to assume responsibility for maintaining the entire existing Freezer refrigeration circuit, compressor, line set, evaporator, condenser, electrical and controls. Ensure uninterrupted operation until new Freezer is operational.
- .2 De-commission existing Walk-in Freezer in accordance with Owner's constraints indicated and reviewed and approved construction phasing plan, only when new Walk-in Freezer No.1 is fully operational.
- .3 De-commission Walk-in Freezer and all related refrigeration equipment and accessories.
 - .1 Pump down refrigeration circuits.
 - .2 Reclaim refrigerant gases as per MOPIA and applicable Federal Government standards.
- .4 Demolish Walk-in Freezer, all related equipment and accessories.
- .4 De-commissioning and demolitions to be undertaken in accordance with all current codes, regulations and Correction Service Canada (CSC) requirements.
- .5 Demolitions to include complete disconnection, and removal of all electrical and mechanical service lines, fittings and accessories.

3.3 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate under other Sections are acceptable for Walk-in Freezers installation and Cold Room equipment installation in accordance with manufacturer's written instructions. Verify adjacent walls are properly sealed including all penetrations. Verify power supply is available and of the correct characteristics.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Report any unacceptable conditions in writing to Departmental Representative.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.
- .2 Verify the work can be installed in strict conformance with all pertinent codes and regulations.

3.4 INSTALLATION:
WALK-IN FREEZER BOXES

- .1 Supply appropriate protection apparatus.
- .2 Install in accordance with manufacturer's written recommendations.
- .3 Erect work true-to-line, plumb, square and level with joints aligned. Fit joints and intersecting members accurately and in true planes adequately fastened.
- .4 Install Walk-in Freezer box units with clearance to building walls as indicated and with clearance between top of unit and room ceiling as indicated.
- .5 Prevent electrolysis between metal skin of Walk-in Freezer box floor panels and concrete by applying isolation coating of type acceptable to Walk-in Freezer panel manufacturer. Apply in accordance with manufacturer's instructions.
- .6 Install Walk-in Freezer box floor panels over radiant floor heating assembly. Refer to Section 23 83 16 – Radiant Heating System for coordination.
 - .1 Heat exchanger for radiant floor heating system, supplied by this Section must be provided to Section 23 83 16 so that underfloor heating system circuit can be completed as required for testing.
 - .2 Ensure radiant floor heating system has been fully tested prior to start of Walk-in Freezer floor panel installation.
 - .3 Ensure radiant floor heating system over-pour is level, 6mm over entire floor plate, prior to start of Walk-in Freezer floor panel installation.
 - .1 Do not install any type of levelling compound over the concrete. Concrete is expected to have been set level.
- .7 Apply continuous bead of sealant in accordance with Walk-in panel manufacturer's instructions at all panel to panel joints in order to make the walk-in box as airtight as possible. Materials and installation as per Walk-in Freezer manufacturer's instructions.
- .8 Install ceiling panels complete with ceiling hanger camlock hooks for ceiling hanger suspension. Refer also to Structural for ceiling panel suspension assembly.
- .9 Keep penetrations through Walk-in Freezer panels to an absolute minimum. Cut or drill holes in panels in accordance with panel manufacturer's instructions to accommodate electrical and mechanical services, runs or connections. Insulate and seal in accordance with indications and with Walk-in Freezer panel manufacturer's instructions. Walk-in supplier is responsible for the proper sealing of all penetrations of the insulated panels.
 - .1 Penetrations must be in accessible locations. Locations are subject to review and approval.
 - .1 Refer to Section 21 13 13 – Fire Suppression Sprinkler for sprinkler installation including requirement for sprinkler boots.
- .10 Cap wrench access holes for panel cam-action locking devices with an in-fitting, flush, stainless steel removable plug button.

- .1 Install all panels with wrench access inside Walk-in Freezer box.
- .11 Install Walk-in Freezer doors, all accessories and hardware in accordance with manufacturer's instructions.
- .12 Seal with specified two-component urethane sealant upon completion of box at the following locations:
 - .1 Around perimeter of bottom of floor panels at top of radiant heating system perimeter steel angle.
- .13 Install removable stainless steel diamond tread floor protection plate overlay, supplied by Section 05 50 00 – Metal Fabrications, over Walk-in Freezer floor panels. Do not mechanically fasten.
- .14 Ramps at entrance to Walk-in Freezer boxes: supplied and installed by Section 05 50 00 – Metal Fabrications. This Section to coordinate installation.
- .15 Install Cold Room prefabricated retrofit doors, frames, hardware and accessories.

3.5 INSTALLATION:
REFRIGERATION SYSTEMS

- .1 Refer also to Section 23 23 00 – Refrigeration Piping
- .2 Handle and install refrigeration equipment: compressors, evaporators condensing units and related accessories in accordance with manufacturer's instructions. Ensure accessibility for maintenance.
- .3 Install evaporator unit level and confirm drain pan completely drains.
- .4 All refrigeration lines shall be furnished and installed in accordance with the C.S.A. - B52 (2013) regulations and good engineering practice.
- .5 Connections shall be brazed with an alloy which meets local codes and regulations. Nitrogen shall be used to purge the lines during the brazing process.
- .6 The system shall be triple evacuated to 100 microns breaking the vacuum with clean dry refrigerant. The dehydrator shall be equal to or superior to the recommended selection designated on the;
- .7 Provide a refrigerant metering device sized to meet the requirements of the particular system.
- .8 All service lines, to accommodate electrical wiring conduits, refrigeration piping, water and drain penetrate through sectional box panels, to be through grommets, insulated and sealed. Holes on faces of sectional panels shall be covered with 1.0mm thick stainless steel escutcheon plates.
- .9 All refrigeration suction lines, which penetrate sectional panel ceilings and/or wall panels, as well as such lines between the evaporator coil and the condensing unit (full length), shall be insulated with 9mm wall thickness insulation conforming to N.F.P.A.-101 and N.F.P.A.-255

code standards. In addition to or in lieu of the foregoing where refrigerant lines, suction and/or liquid, penetrate fire-separation walls, such lines shall be insulated with a fire-rated material of a type approved by the governing authority.

- .10 Heater cable shall be wrapped around the condensate drain line from the evaporator coil (Freezer sections) for a distance of 305mm beyond the sectional wall panel. Heater cable shall be wrapped around the drain line thirty (30) turns per metre of length for the full length of the drain line. After the heater cable has been wrapped around the drain, cover completely with an externally mounted insulation.
 - .1 Final wiring connection of the heater cable shall be under Division 26.
- .11 All fittings, controls, valves and accessories shall be mounted and connected to a focal point ready for final service connections under Division 22, 23 and Division 26.
- .12 Interwire from Freezer compressor to Freezer evaporator coil to operate blower motors, defrost, and heater cable by Division 26.
- .13 Interwire from timer at compressor for the Cold Room to solenoid valve at blower coil by Division 26.

3.6 LEAK TEST

- .1 Supply initial charge of refrigerant and oil for each refrigeration system. Losses of oil or refrigerant prior to acceptance of equipment or due to defects covered under guarantee shall be replaced.
- .2 Supply, one complete change of lubricating oil in addition to that placed in the system.
- .3 Charge the system with refrigerant and Leak Test the entire system for leaks after completion of installation. Repair leaks, put system into operation, and test equipment performance.
- .4 Refer to Correctional Service Canada (CSC) forms following this Section:
 - .1 Leak Test Notice for Refrigeration and Air-Conditioning System.
 - .2 Refrigeration System or Air-Conditioning System Service Log.

3.7 ADJUSTING CONTROLS

- .1 Remove protective coverings and test and adjust operating equipment.
- .2 The temperature controls, within the sectional Walk-In Boxes, shall be calibrated to maintain the following operating temperatures:
 - .1 Walk-in Freezers refrigeration: minus 25 degrees C.
 - .2 Cold Room refrigeration: 4 degrees C.
- .3 The above temperatures are to be measured in the return air flow to the evaporator coil.

3.8 COMPONENT LABELING

- .1 Clearly label all components, controls, switches and sensors.

-
- .2 Prominently display refrigerant and lubricant type.
 - .3 Indicate all set-points on sheet mounted in location as directed.
 - .1 Include all set-points for field adjusted components.
- 3.9 CLEANING
- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean equipment and apparatus.
 - .3 Re-finish damaged coatings and finishes.
 - .2 Final Cleaning:
 - .1 Upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .2 Remove protective coatings on all items.
 - .3 Clean units thoroughly inside and out, including rooftops of each Freezer.
 - .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- 3.10 PROTECTION
- .1 Protect installed products and components from damage during construction.
 - .2 Repair damage to adjacent materials caused by installation.
- 3.11 COMMISSIONING
- .1 Commissioning of the Walk-in Freezers and Cold Room equipment is required in accordance with Section 01 91 13 - General Commissioning (Cx) Requirements, Section 01 91 31 – Commissioning (Cx) Plan and Section 01 91 33 – Commissioning Forms.
 - .2 Manufacturer's Representative(s) shall provide support throughout commissioning process.
 - .3 Prepare and complete Building Commissioning: Check List, Start-up, Static Verification and Functional Performance Verification.
 - .4 Commissioning shall be performed in the presence of the General Contractor. Departmental Representative shall be present for part or all of the proceedings.
 - .5 Start-up system in accordance with equipment manufacturer's written instructions.
 - .6 Final commissioning to take place with installation fully complete, operational and pre-tested.
 - .1 Pre-testing:

- .1 Test all Walk-in Freezers and Cold Room equipment operation and performance. Make all adjustments and repairs as required.
- .7 System Start-up Checklist complete with Start-up Procedures: submit checklist for review prior to proceeding.
 - .1 The checklist must include but is not limited to the following:
 - .1 Verify sensor and control functions.
 - .2 Verify user interfaces and functional initial set-points and operating schedules have been programmed.
 - .3 Check refrigerant temperatures, pressures and evaluating set-points.
 - .4 Verify condenser and suction conditions.
 - .5 Verify operation of alarms
 - .6 Evaluate refrigeration piping
 - .7 Evaluate all electrical and refrigeration connections
 - .8 Evaluate equipment mounting
 - .9 Ensure safety controls are adjusted properly
 - .10 Verify anti-sweat heater control operation.
 - .11 Verify defrost adequacy and defrost control operation.
 - .12 Verify air infiltration at walk-in boxes has been minimized.
 - .13 Start-up Procedures for charging and initial operation complete with observation requirements.
 - .14 Performance of compressors and that of all moving components should be watched carefully through the first operating cycle and throughout the first day of operation.
- .8 Submit technical procedures for checking Compressor Superheat and evaporator Superheat.
- .9 System Operational Checklist and Procedures: submit for review prior to proceeding.
 - .1 To be performed when the system has been running trouble-free for an extended period (minimum two weeks) and design conditions are satisfied.
 - .2 The checklist must include but is not limited to the following:
 - .1 Check discharge and suction pressures.
 - .2 Check liquid line sight glass and expansion valve operation.
 - .3 Check for refrigerant leaks.
 - .4 Check thermostatic valve for proper superheat settings.
 - .5 Check voltage and amperage readings at compressor terminals.
 - .6 Check high pressure control setting.
 - .7 Check low pressure settings.
 - .8 Re-check safety and operating controls.
 - .9 Check defrost controls for initial and termination settings, length of defrost period. Set failsafe on timeclock in accordance with manufacturer's instructions.
- .10 Product Identification/Start-up Information Form:
 - .1 Start-up information must be completely recorded for each

- installation to serve as a record for future reference.
- .2 Sample form to be provided by Departmental Representative.

- .11 Submit for review, a signed Report outlining procedures followed and testing results.
 - .1 Indicate any system deficiencies. If deficiencies are found, indicate procedures and schedule for rectifying deficiencies. Indicate further testing required.
 - .2 When deficiencies are rectified, submit a follow-up report for review.

3.12 DEMONSTRATION AND TRAINING

- .1 All equipment to be fully tested and adjusted prior to scheduling demonstration and training.
- .2 Demonstrate operation, operating components, adjustment features, and maintenance requirements to Owner in accordance with Section 01 79 00 – Demonstration and Training.
 - .1 Refer to Section 01 79 00 – Demonstration and Training for submittal requirements prior to scheduling the session.
- .3 Demonstration and training to be conducted by competent representative(s) of the supplier and installer.
- .4 Arrange with the factory representatives of standard (catalogue items) equipment to be present at the equipment demonstration.
- .5 Coordinate with the General Contractor for a suitable date and time for the demonstration. It shall be the responsibility of this contractor to ensure that all manufacturers are advised of this time.
- .6 Provide a written report, in triplicate, to the General Contractor, following the equipment demonstration, listing all those persons who were in attendance for the demonstration and include a report describing all activities and indicating any malfunctions of the equipment and/or deficiencies outstanding encountered during demonstration.



**LEAK TEST NOTICE FOR REFRIGERATION
AND AIR-CONDITIONING SYSTEM**

**AVIS D'ESSAIS DE DÉTECTION DES FUITES
POUR LES SYSTÈMES DE RÉFRIGÉRATION
ET DE CLIMATISATION**

▶ NOTE: Letters A to J on this form, are in reference to the Federal Halocarbon Regulations, 2003	▶ NOTA : Les lettres A à J figurant sur ce formulaire, font références au Règlement fédéral sur les halocarbures, 2003
▶ Environmental Guidelines (EG) Management of Halocarbons EG 318-4	▶ Lignes directrices environnementales (LDE) Gestion des halocarbures LDE 318-4

(a) OWNER OF SYSTEM – PROPRIÉTAIRE DU SYSTÈME			
Name of institution – Nom de l'établissement		Address – Adresse	
Contact – Personne-ressource			
Telephone no. – N°. de téléphone	City – Ville	Province	Postal code – Code postal

(b) – (d) OPERATOR OF SYSTEM – OPÉRATEUR DU SYSTÈME			
(b) Name of operator of system – Nom de l'opérateur du système		(c) Specific location of system – Emplacement précis du système	
(d) Description of system – Description du système			
Brand – Marque	Model – Modèle	Serial number – Numéro de série	Other – Autre

(e) – (g) CERTIFIED PERSON – PERSONNE ACCRÉDITÉE	
(e) Name of certified person – Nom de la personne accréditée	(f) Certificate no. (certified person) – N°. de certificat (personne accréditée)
(g) Name of employer of certified person (if applicable) – Nom de l'employeur de la personne accréditée (s'il y a lieu)	

(h) - (j) OTHER – AUTRE		
(h) Type of halocarbon contained in system Type d'halocarbure contenu dans le système	(i) Charging capacity of system (specify unit) Capacité de charge du système (précisez l'unité)	(j) Date of last 2 leak tests performed on system Date des 2 derniers essais de détection des fuites (refer to service log) (se référer au registre d'entretien)
	<input type="checkbox"/> Kg	▶
	<input type="checkbox"/> Lbs-livres	▶
	<input type="checkbox"/> Tons - tonnes	

COMMENTS – COMMENTAIRES		
FORM COMPLETED BY – FORMULAIRE REMPLI PAR		
Name – Nom	Title – Titre	Telephone no. – N°. de téléphone
Signature ▶		Date (YYYY/MM/DD-AAAA/MM/JJ)

DISTRIBUTION:

Original : File 590-7
Original : Dossier 590-7

Copy : On the system
Copie : Sur le système

Copy : Service log
Copie : Registre d'entretien



**REFRIGERATION SYSTEM
OR AIR-CONDITIONING SYSTEM SERVICE LOG**

**REGISTRE D'ENTRETIEN D'UN SYSTÈME
DE RÉFRIGÉRATION OU DE CLIMATISATION**

▶ NOTE: Letters A to J on this form, are in reference to the
[Federal Halocarbon Regulations, 2003](#)

▶ [Environmental Guidelines \(EG\)](#)
[Management of Halocarbons - EG 318-4](#)

▶ NOTA : Les lettres A à J figurant sur ce formulaire, font références au
[Règlement fédéral sur les halocarbures, 2003](#)

▶ [Lignes directrices environnementales \(LDE\)](#)
[Gestion des halocarbures - LDE 318-4](#)

(a) OWNER OF SYSTEM – PROPRIÉTAIRE DU SYSTÈME

Name of institution – Nom de l'établissement	Address – Adresse		
Contact – Personne-ressource			
Telephone no. – N°. de téléphone	City – Ville	Province	Postal code – Code postal

(b) – (c) – (d) OPERATOR OF SYSTEM – OPÉRATEUR DU SYSTÈME

(b) Name of operator system – Nom de l'opérateur du système		(c) Specific location of system – Emplacement précis du système	
(d) Description of system – Description du système			
Brand – Marque	Model – Modèle	Serial number – Numéro de série	Other – Autre

(e) – (f) – (g) TECHNICIAN – TECHNICIEN

(e) Name of certified person – Nom de la personne accréditée	(f) Certificate no. (certified person) – N° de certificate (personne accréditée)
(g) Name of employer of certified person (if applicable) – Nom de l'employeur de la personne accréditée (s'il y a lieu)	

(h) – (i) – (j) HALOCARBON SYSTEM – SYSTÈME AUX HALOCARBURES

(h) Dated list of leak test, leaks detected and leak repairs – Liste datée des essais de détection, des fuites détectées et de leur réparation	
(i) Type and quantity of halocarbon (specify unit) Type et quantité d'halocarbure (précisez l'unité)	Date recovered Date de la récupération
<div><div></div><div></div><div></div></div> <div><div>Kg</div><div>Lbs-livres</div><div>Tons - tonnes</div></div>	<div><div></div><div></div><div></div></div> <div><div>Kg</div><div>Lbs-livres</div><div>Tons - tonnes</div></div>

COMMENTS – COMMENTAIRES

FORM COMPLETED BY – FORMULAIRE REMPLI PAR

Name – Nom	Title – Titre	Telephone no. – N°. de téléphone
Signature		Date (YYYY/MM/DD-AAAA/MM/JJ)
▶		

DISTRIBUTION:

Original : File 590-7
Original : Dossier 590-7

Copy : On the system
Copie : Sur le système

Copy : Service log
Copie : Registre d'entretien