PART 1 – GENERAL

1.1 REFERENCE STANDARDS

.1 American Iron and Steel Institute (AISI)

.2 ASTM International
.1 ASTM A 167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
.2 ASTM A 240/A 240M-16, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
.3 ASTM A 269-15A, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
.4 ASTM A 480/A 480M-16B, Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
.5 ASTM B 456-08, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.3 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-19.13-M87, Sealing Compound, One Component, Elastomeric, Chemical Curing.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

.5 The Public Health and Safety Company (NSF International).

1.2 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 and the following:
.1 Description of equipment giving manufacturers name, type, model, year and capacity.
.2 Details of operation, servicing and maintenance.
.3 Recommended spare parts list.

.3 Shop Drawings:
.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Nova Scotia Canada.
.2 Indicate construction details of equipment including materials,

components, metal thicknesses, reinforcements, welds and weld types, interior and exterior corner and joint details, anchorages, locations of exposed fasteners, assembly methods, finishes, mechanical and electrical characteristics.

.3 Indicate roughing-in service requirements for mechanically and electrically operated equipment.

.4 Quality control submittals: submit following in accordance with Section 01 45 00 - Quality Control.

.1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.

.2 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

.5 Closeout Submittals:

.1 Provide operation and maintenance data for various equipment for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.3 QUALITY ASSURANCE

.1 Pre-Installation Meetings: convene pre-installation meeting 1 week prior to beginning work of this Section and on-site installation, with contractor's representative Departmental Representative in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart to verify project requirements.

PART 2 – PRODUCTS

2.1 MATERIALS

.1 Stainless steel sheet: to ASTM A 240/A 240M, Type 304 with AISI No.4 finish, thicknesses as follows:

.1 Exposed frames, uprights angles, reinforcements: 2.0 mm.

.2 Table tops, counter tops, drainboards, pot sinks and sinks over 508 mm x 508 mm, splashbacks: 2.0 mm.

.3 Shelves, utility sinks 508 mm x 508 mm or smaller, angle slides: 1.6 mm.

.4 Exposed bodies of cabinets, casing of exposed electrical outlets, ventilation ducts: 1.3 mm.

.5 Interior partitions of cabinets, lining of insulated cabinets, skirting, interior and exterior surfaces of doors and drawers: 1.0 mm.

.2 Stainless steel tubing: to ASTM A 269, Type TP304, commercial grade,

seamless and welded with AISI No. 4 finish.

.3 Hardware and fastenings: stainless steel.

.4 Filler strip: stainless steel, thickness to match adjacent material, same finish as surrounding components.

.5 Sealant: to CAN/CGSB-19.13, non toxic aluminum coloured sealing compound, adhesive/sealant, meeting NSF requirements for direct contact with food and stay flexible during long term exposure to temperatures ranging from minus 73 degrees C to plus 232°C.

2.2 FABRICATION

.1 Exposed surfaces: stainless steel unless otherwise indicated.

.2 Fabricate equipment from stainless steel, to sizes and configurations indicated.

.3 Fabricate work square, true, straight, to suit installation conditions and as indicated.
.1 Design to maximum sanitary conditions in accordance with NSF requirements.

.4 Fit and shop-assemble equipment ready for erection where possible.

.5 Deburr, smooth and round off raw edges prior to forming.

.6 Straight lengths: counter tops.
.1 One continuous piece if 3.0 m or less in length.
.2 If over 3.0 m, sections to be welded unless otherwise indicated.

.7 Welding: sound, non-porous, and free from imperfections.
.1 Weld metal: colour matched and corrosion-resistant as parent metal.
.2 Spot welds: minimum 3.0 mm diameter with full penetration.
.3 Grind exposed welds smooth and polish to match parent metal.
.4 Grind other welds smooth.
.5 Welding and finishing is not to impair corrosion resistance of finished article.
.6 Welds, except spot welds: continuous unless otherwise indicated.

.8 Legs and bracing: demountable, of stainless steel tubing, with 12 mm thick stainless steel mounting plates, welded construction with stainless steel sanitary, adjustable, bullet feet.
.1 Mounting screws: welded to 2.5 mm thick stainless steel leg channels.
.2 Legs: 41 mm od tubing 1.6 mm thick stainless steel.
.3 Bracing: 30 mm od tubing 1.2 mm thick stainless steel on back and sides only.

.9 Solid undershelf: 2 mm thick stainless steel, edges boxed, backs up 50 mm and folded at walls shelf supports welded to legs and bracing, 255 mm clear of floor at mid-way adjustment of feet.
.1 With adjustable shelves, use sanitary type supports.

2.3 SINK UNITS

.1 Compartment material: minimum 2 mm thick stainless steel.

.2 Corners:
.1 Horizontal and vertical minimum radius 19 mm on both planes, with coved corners.
.2 Corners of tops: outside radius minimum 38 mm.

.3 Construction: welded.

.4 Compartment bottom: slope down towards drain.

.5 Corner type drain: 38 mm complete with tail piece, chrome plated brass or stainless steel standing overflow and stainless steel perforated strainer.
.1 Height of standing overflow: 50 mm below the counter top or drainboard.
.2 Perforated strainer: extend 19 mm above top of standing overflow.

.3 Where multiple compartments are indicated, space between compartments maximum of 25 mm and minimum of 13 mm.
.1 Weld compartments into counter top of drainboards.

.4 Drill holes for hot and cold water faucets.

.5 Edges: up and rolled.

.6 Top of sink edge and drainboard: straight horizontal line.

.7 Splashback : 2 mm thick stainless steel, rolled up and splayed, integral with sink, drainboard or top
.1 Where counter top or drainboard meets splash back or upturn, cove 19 mm unless otherwise indicated.

.8 Legs and bracing: as specified.

.9 Skirting: 1 mm thick stainless steel on single or multiple compartment sinks.
.1 Skirting on exposed external surfaces: extend under sinks 25 mm past bottom radii, be continuously welded under sinks, to follow vertical external radii at extreme ends, or fitted and welded to integral components as appropriate.
.2 Space spot welds maximum of 100 mm on centers.

2.4 CABINETS AND COUNTERS

.1 Support individual cabinet sections with at least four(4) adjustable stainless steel leveling legs and feet not over 1800 mm apart longitudinally, not over 760 mm from front to back.

.2 Tops, splashbacks and shelves: 2 mm thick stainless steel, all welded construction.

.3 Body: 1 mm thick stainless steel.

.4 Pilaster: 2 mm thick stainless steel.

.5 Angle slides: 1.6 mm thick stainless steel angles, minimum 50x50 mm welded to 2 mm thick stainless steel supports.
.1 Length of angle to suit, with front inside corners radiused 19 mm.
.2 Stops: prevent trays from sliding off back, in open equipment.

.6 Doors: hinged, double pan, welded, stainless steel construction, 1 mm metal core thickness, rigid mineral insulation core.
.1 Finish: AISI 2B for inside pan.

.7 Hinged door hardware: stainless steel piano hinge, length to suit door

.8 Handles: stainless steel surface mounted.

2.5 DISHWASHER

.1 Size: 608 x 609 x 865 mm high.

.2 Type: High Temperature Sanitizing under counter dishwasher electrically heated thermostatically controlled c/w low water cut off, automatic fill, automatic pumped drain, detergent pump and built-in (60°C) rise booster.

.3 Equipment: Standard, including top and side panels.

.4 Extra Equipment: Supply unit c/w disconnect switch c/w Nema enclosure suitably, rated for motors mounted on rear wall as required by local electrical codes.

2.6 REFRIGERATOR/FREEZER SHELVING (ROOMS 2052 & 2052A)

.1 Posts: trilobal cold rolled steel – epoxy powder coated finish with antimicrobial additive, grooved and numbered at 25.4 mm intervals with post cap, stem receptacle, and leveling foot.
.1 Footplates:

.1 3/8-16 x 46 mm UNC thread hexagonal domed head cold rolled steel bolt resistance welded to 3.0 mm (11 ga.) triangular base plate with 8.7 mm mounting holes, zinc plated.

.2 Shelves shall be in modular lengths as indicated on the drawings.
.1 Shelf Mat Frames: perimeter trusses consisting of 4.8 mm (7 ga) serpentine wires resistance welded to 6.4 mm dia. top and bottom support wires and gas metal arc welded to formed 2.3 mm cold rolled steel collars with 6.4 mm dia. longitudinal center support trusses gas metal arc welded to frame perimeter. Epoxy powder coated.
.2 Shelf Release & Wedge: Injection molded glass-reinforced nylon
.3 Stem Receptacle and Leveling Foot: Injection molded glass reinforced nylon.
.4 Open grid mats: Injection molded glass-reinforced polypropylene co-polymer, impregnated with antimicrobial additive.
.5 Ledges, dividers, and Miscellaneous Accessories: epoxy powder coated cold rolled steel wire and polymer.
.6 Load ratings shall be 375 kg equally distributed for shelves up to 1220 mm long, and 275 kg equally distributed for shelves up to 1825 mm long.
.7 Open grid mats shall lift off for dishwasher cleaning.

.3 Quantity: 20
1(one) 762 x 457 x 1830 mm high
18(eighteen) 914 x 457 x 1830 mm high
1(one) 1825 x 610 x 1830 mm high

.4 Equipment: Each section C/W(4) only shelves and uprights.

2.7 WALK-IN REFRIGERATIOR/FREEZER PANELS AND DOORS

.1 Panels shall consist of interior and exterior metal pans formed to constitute a rigid wall without wood structural members. Panel edges shall have a matching tongue and groove profile formed in foaming operation to provide a continuous foam to foam airtight contact without the use of gaskets or sealers, locked in position by means of eccentric fastening devices operated from interior of the box. Wall panels to match existing height 90 deg. angle sections shall be utilized for corners and "T" sections at partition junctions.

.2 Insulation: Rigid foamed in place polyurethane with thermal conductivity of not more than 0.017 W/(M°*C*) rated self-extinguishing fire retardant. Overall wall thickness shall be not less than 75 mm to provide sufficient insulation to enable cooling equipment to maintain 55°*C* temperature differential.

.3 Finish: The exposed interior and exterior wall shall be white epoxy acrylic high baked enamel on 0.6 mm steel applied in 2 coats with minimum thickness of 0.127 mm.

.4 Hinged Doors: Entrance openings shall be 864 x 1930 mm high, unless otherwise specified, provided in standard door panel section. Door shall be infitting.

.1 Construction: Door panel section and door as specified for wall.

.2 Insulation: As specified for walls.

.3 Breaker Strip: Door openings shall be trimmed with non conductive breaker strips.

.4 Hardware: Heavy duty hinges & latches, 2 hinges per door. Provide latch c/w inside safety screw release and fitting for padlock.

.5 Gasket: Provide replaceable thermoplastic gasket resistant to oil, fat, water and sunlight and mount along top and both sides of the door. Bottom edge of door shall be fitted with an adjustable rubber wiper gasket.

.6 Lighting: Provide with door section on the latch side of door approximately 1829 mm above the floor, an operating toggle switch and pilot light interwired within the panel to a vapour proof junction box and incandescent light.

.7 Thermometer: Provide door section on the latch side of door approximately 1829 mm above the floor, one only pure Celsius dial indicating thermometer c/w range of -25°*C* to 18°*C*.

.8 Aluminum checker plate on door front, frame and edges 1220 mm high.

.5 Cover Strips and Furring: Supply and install cover strips at junction of refrigerator wall and ceiling panels to masonry wall and building ceiling of a material and finish as specified for wall panels. Strips secured with fastenings finished to match.

.6 Openings: Openings through wall or ceiling panels for passage of electrical wiring, refrigeration tubing to coil and coil condensate drain shall be fitted with through the wall type grommets. Grommets are to be sealed in place and fitted with sealing compound, after installation of wiring and piping.

.7 Erection: Modify existing walk-in refrigerator/freezer room panels to allow installation of new panels and door opening indicated on drawings.

.8 New refrigerator/freezer components shall be compatible with existing.

PART 3 – EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install food service equipment plumb with cabinets and counters level to 1.5 mm in 3050 mm.

.2 Level base cabinets by adjusting levelling legs.

.3 Scribe and fit stainless steel filler strips to irregularities of adjacent surfaces, maximum gap opening 0.5 mm.

.4 Secure equipment to floor and wall as indicated.

.5 Securely fasten wall cabinets as indicated.

.6 Fastening: where stationary or fixed and matching items butt against one another, join with concealed stainless steel fasteners.

.7 Seal joints in accordance with Section 07 92 00 - Joint Sealants.
.1 Where joints cannot be sealed with single pass, use stainless steel filler strip in conjunction with sealant.
.2 Where items are against or through walls or partitions seal resultant joint.

.8 Field weld counter tops joints over 3 m long.

3.3 FIELD QUALITY CONTROL

.1 Inspection: Departmental Representative will conduct shop inspections of equipment fabrication prior to delivery to site.

.2 Manufacturer's Field Services:
.1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.4 ADJUSTING

.1 After installation fit and adjust operating hardware.

3.5 DEMONSTRATION AND TRAINING

.1 Manufacturer to demonstrate equipment capabilities, operation, safety and minor user maintenance to approval of Departmental Representative.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 23 07 15 - Thermal Insulation for Piping.

.2 Section 23 54 14 - Halo Carbon Management.

1.2 REFERENCE STANDARDS

.1 American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME)
.1 ANSI/ASME B16.26-2006, Cast Copper Alloy Fittings for Flared Copper Tubes.
.2 ANSI/ASME B16.29-2007, Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings-DWV.

.2 American National Standards Institute/National Fire Protection Association (ANSI/NFPA)
.1 ANSI/NFPA 255-2006, Standard Method of Test of Surface Burning Characteristics of Building Materials.

.3 ASTM International
.1 ASTM A 167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
.2 ASTM A 240/A 240M-11a, 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-11a, 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-10, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
.5 ASTM B 88M-09, Standard Specification for Seamless Copper Water Tube Metric.
.6 ASTM B 280-08, Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
.7 ASTM E 84-11a, Standard Test Method for Surface Burning Characteristics of Building Materials.
.8 ASTM E 162-11a, Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.

.4 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-19.13-M87, Sealing Compound, One-Component,

Elastomeric, Chemical Curing.

.5 CSA International
.1 CSA C22.2 No.137 -M1981(R2004), Electric Luminaires for Use in Hazardous Locations.

.6 Society of Automotive Engineers (SAE)

.7 Underwriters' Laboratories of Canada
.1 CAN/ULC-S704-11, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
.2 CAN/ULC-S705.1-2001, Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for cooler refrigeration equipment and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
.1 Indicate on drawings:
.1 Construction details of equipment by drawings and manufacturers' literature.
.2 Roughing-in requirements for mechanical and electrical services.
.3 Installation details.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for walk-in freezers and coolers for incorporation into manual.

1.5 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 Replace defective or damaged materials with new.

PART 2 – PRODUCTS

2.1 REFRIGERATION EQUIPMENT (FOR REMOTE INSTALLATION)

.1 Refrigeration equipment: with refrigerant, fully automatic in operation, and to conform to following minimum requirements:
.1 Single condensing unit (CU-1) with 3 stages cooling to serve five(5) evaporator units (EU-1, EU-2, EU-3, EU-4 & EU-5) with independent control. Condenser shall be air-cooled with hermetically sealed type scroll compressors mounted in a common enclosure. Refer to mechanical schedule for equipment sizing.
.1 Design unit for 16 hours to 18 hours operation at specified evaporating temperature, in 32.2°C ambient temperature.
.2 Unit shall be capable of operating in ultra low ambient conditions -30°C minimum.
.3 Each Evaporator Coil shall be interlocked with a local unit heater.
.1 Heater signal shall be sent out to the local inerlocked unit heater according to the temperature difference between set temperature and indoor room temperature (adjustable).
.2 Evaporator: forced-air unit-cooler type, suspended from ceiling panels, with forced-air discharged parallel to ceiling.
.1 Copper Tube aluminum fin coil assembly. Evaporator unit to be from same manufacturer as condensing unit.
.2 Air circulation motors: lifetime sealed.
.3 Entire unit-cooler assembly readily accessible for cleaning. Provide drip pan and drain connection.
.4 Room temperature sensor for evaproator coil to be provided and installed.
.5 Equip unit coolers with mounting brackets for installation and controls for safe and satisfactory operation.
.6 Include disconnect switch within 600 mm of evaporator motor.

.2 Refrigerant tubing:
.1 Conform to ASTM B 88M and ASTM B 280 requirements.
.2 Relief valve discharge pipe on outdoor installations shall be copper tube type "L" with brazed joints.
.3 Fittings:

.1 Conform to ANSI/ASME B16.26 and ANSI/ASME B16.29.
.2 Long radius type for elbows and return bends.

.3 Controls:
.1 Cooler room refrigeration system shall have a local control panel to allow setting of individual room temperatures.
.2 EU-1 in combination with UH-1 shall be capable of maintaining a room temperature range between 12°C and 30°C. Room 2052 set-point to be control by local users.
.3 EU-2 in combination with UH-2 shall be capable of maintaining a room temperature range between 12°C and 30°C. Room 20 52A set-point to be control by local users.
.4 EU-3 in combination with UH-3 shall be capable of maintaining a room temperature range between 12°C and 30°C. Room 2051 set-point to be control by local users.
.5 EU-4 in combination with UH-4 shall be capable of maintaining a room temperature range bet tween 4°C and 30°C. Room 2047 set-point to be control by local users.
.6 EU-5 in combination with UH-5 shall be capable of maintaining a room temperature range between 12°C and 30°C. Room 2046 set-point to be control by local users.

2.2 DRAIN LINES AND HEATER CABLES

.1 Provide necessary drain lines to funnel drains and heater cables as required.

2.2 SOURCE QUALITY CONTROL

.1 Ensure equipment is manufactured and installed by company having personnel skilled in manufacturing and installing of prefabricated walk-in freezers and coolers.

PART 3 – EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for walk-in freezers and coolers installation in accordance with manufacturer's written instructions.
.1 Visually inspect substrate in presence of Departmental Representative.
.2 Inform Departmental Representative of unacceptable conditions

immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Supply appropriate protection apparatus.

.2 Install in accordance with manufacturer's written recommendations.

.3 Cut or drill holes in panels, as required, to accommodate electrical and mechanical services, runs or connections.
.1 Insert teflon sleeves into holes and seal.
.2 After installation of services, fill remaining space with insulation.

.4 Cap wrench access holes with an in-fitting, flush, stainless steel removable plug.

3.3 ADJUSTING

.1 Remove protective coverings and test and adjust operating equipment.

3.4 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 in accordance with Section 01 45 00 - Testing Quality Control.
.3 Re-finish damaged coatings and finishes.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials in accordance with 01 74 21 - Construction/Demolition Waste.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by product installation.

END OF SECTION