PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED SECTIONS

.1 Section 11 13 19: Hydraulic Loading Dock.

1.3 REFERENCES

.1 CAN/CGSB-44.40, Steel Clothing Locker.

.1 ASTM International

.1 ASTM D624-00(2007), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.

.2 ASTM D1171-99(2007), Standard Test Method for Rubber Deterioration-Surface Ozone Cracking Outdoors or Chamber (Triangular Specimens).

3 ASTM D2632-01(2008), Standard Test Method for Rubber Property-Resilience by Vertical Rebound.

.2 Green Seal Environmental Standards (GS)

.1 GS-11-2008, 2nd Edition, Paints and Coatings.

.2 GS-36-00, Commercial Adhesives.

1.4 SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:

.1 Submit manufacturer's printed product literature and data sheets for loading dock bumpers and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of New Brunswick, Canada.

.2 Indicate on drawings:

.1 Dimensions and required clearances.

.2 Fastening methods for dock bumpers.

.4 Samples:

.1 Submit duplicate samples of 300 mm long sections of dock bumpers.

1.5 DELIVERY, HANDLING AND STORAGE

.1 Deliver, store and handle materials in accordance with Section 01 61 00 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 loading dock bumpers from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse and return by manufacturer pallets, crates, padding, and packaging materials in accordance with Section 01 74 22.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Laminated Dock Bumper:
- .1 Nylon impregnated heavy duty industrial rubber 254 x 305 mm, with 230 mm overall projection.
  - .1 Pads punched to receive 19 mm steel supporting rods.
- .2 Rubber pads laminated between structural steel angles and compressed under approximately 680 kg pressure.
  - .1 Angles welded to 19 mm steel rods at one end and closed with threaded rod and nut at other end.
- .3 Anchor leg of angle extends 76 mm beyond rubber surface at each end and contains two or three 21 mm anchor bolt holes as required.
- .4 Hot-dipped galvanized finish for exposed metal parts.

.2 Primers Paints: in accordance with manufacturer's recommendations for surface conditions.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates and surfaces previously installed under other Sections or Contracts are acceptable for loading dock bumper installation in accordance with manufacturer's instructions prior to loading dock bumper installation.
- .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 from Departmental Representative.

3.2 INSTALLATION

.1 No assembly required for pre-manufactured unit.
- .1 Install loading dock bumper as indicated.

.2 Laminated Dock Bumper: weld structural mounting angles as per manufacturer's instructions.

3.3 **CLEANING**

.1 Progress Cleaning: clean in accordance with Section 01 74 11.
  .1 Leave Work area clean at end of each day.

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 22.
  .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 **PROTECTION**

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

.2 Repair damage to adjacent materials caused by loading dock bumper installation.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED SECTIONS

.1 Section 11 13 13: Dock Bumpers.

.2 Division 26: Disconnect switch at power unit, conduit and wiring between disconnect switch, power unit, dock ramp and control station

1.3 SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:

.1 Submit manufacturer's printed product literature and data sheets for hydraulic dock levellers and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Indicate manufacturer's name, model number, size, material and finish; motor horsepower and rpm; storage tank working pressure; cylinder factory tested pressure, pipe and hose type and size.

.2 Indicate on drawings: dimensions and required clearances.

.4 Indicate pit layout, location of storage tank, power unit, pump, jack linkage, valves and piping.

.5 Indicate details of cylinder, plunger, pump, motor, valves and operating station.

.6 Certificates: Submit written manufacturer's certificate certifying compliance with specification requirements for operation.

1.4 MAINTENANCE DATA

.1 Submit maintenance data for maintenance manuals specified in Section 01 78 00.

.2 Include sequence of operation; wiring diagram; electrical characteristics; parts list with cuts, numbers and supplier's name and address.

.3 Indicate hydraulic and electrical component manufacturer's names and numbers for each part used in assembly, number to match that on part.

.4 Indicate location, frequency and description of method of adjustment, lubrication and parts replacement.

1.5 WARRANTY

.1 Commence repair of breakdowns or deficiencies in operation within 24 hours of notification.

.2 Inspect hydraulic dock ramp 30 days before expiry of warranty period and correct defects within 15 days of inspection.

1.6 **CHARACTERISTICS**

.1 Size: 1830 mm wide x 2440 mm long.
.2 Capacity: 9000 kg axle load.
.3 Travel: 350mm above platform. 300 mm below platform.
.4 Lip extension: 400 mm.
.5 Power supply: 115 volt; 1 phase; 60 hertz; AC.

PART 2 - PRODUCTS

2.1 **MATERIALS**

.1 Steel: to CSA-G40.20-04(R2009)/G40.21- 04(R2009), Grade 300W, minimum 25% recycled content.

.2 Steel floor plate: hot rolled steel top surface non-slip, minimum lug height 1.0 mm, minimum 25% recycled content. Finish: factory applied one coat of protective grey paint.

.3 Welding material: to CSA W59-03(R2008).

.4 Bearings and bushings: sealed, self- lubricating.

.5 Neoprene: moulded, black, 30 to 40 durometer hardness.

.6 Wiring: TWH insulation, copper conductors.

.7 Rigid piping: required to suit oil pressure.

.8 Flexible hose: required to suit oil pressure and maintain flexibility.

.9 Primer: to Master Painters Institute MPI# 79 - Primer, Alkyd, Anti-Corrosive for Metal. Ecologo certified.

.10 Undercoat: lead primer to CAN/CGSB-1.140-M89, Ecologo certified.

.11 Paint: exterior enamel to CAN/CGSB-1.59-97, Ecologo certified, in safety yellow colour to CGSB 1-GP-12c+Amdt-Feb-85, number 505-101.

2.2 **FABRICATION**

.1 To Occupational Health and Safety Division, Industrial Health and Safety Branch, Engineering Data Sheet No.8-03, June 1980, unless otherwise specified.

.2 Mounting; Integral steel box structure to be cast in place.

.3 Cylinder: Bore turned, polished, seamless steel pipe with oil connections, positive stop ring, top and bottom bearing mounting, size to suit efficiency and safety, piston type with stuffing box, packing, plunger wipe and packing gland or displacement type with positive stop ring and limit switch preventing platform travel beyond stated limits.

.4 Power unit: remote, minimum 372 W motor with overload protection, directly connected pump with pressure relief valve bypassing oil back to reservoir, oil piping, wiring, conduit, check valve, and flexible hose, metal enclosure and wall support frame.

.5 Oil reservoir: integral with torque tube or separate non-ferrous metal tank or steel tank with strainer assembly, overflow, drain connection and protected vent opening.

.6 Platform: steel floor plate welded to steel members of size, type and spacing required to accommodate capacity load in out-of-level condition without deformation or affect on operation. Out-of-level compensation, minimum 100 mm, when floating on truck bed.

.7 Toe guard: steel plate side skirts both sides of dock ramp for full width and height of ramp, with ramp at highest position.

.8 Safety lock: velocity fuse at cylinder inlet to limit downward travel of ramp top maximum 75 mm if trailer or truck moves away while carrying capacity load.

.9 Control station: pushbutton, continuous pressure operation, wall mounted, to complement operation.

.10 Shop apply 1 coat of primer, 1 coat of undercoat and 2 coats of paint to metal surfaces.

.11 Weatherseals: neoprene, mounted on curb angles, continuous both sides and across back of platform in cross traffic position.

.12 Maintenance strut: steel, size and type to support ramp in up position while being serviced.

.13 Override switch: prevent dock ramp rising when overhead door is closed.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 In accordance with manufacturer's instructions.

.2 By mechanics experienced in this work.

.3 Turn components built into concrete and templates over to Division 03 – Concrete for building in.

.4 Centre and shim plumb, level and square to a tolerance of 1:500, flush with adjoining surfaces.

.5 Securely fix components in place.

.6 Mount power unit on interior wall 2000 mm above floor.

.7 Mount control unit on interior wall 1200 mm above floor.

.8 Extend and connect hydraulic piping between power unit and dock ramp.

.9 Fill hydraulic system with oil.

.10 Adjust and align components to achieve smooth dock ramp operation.

.11 Touch up scratched and chipped paint.

.12 Lubricate components.

3.2 **OPERATION**

.1 Activate control station button, ramp rises.

.2 Dock leveller to travel to highest position.

.3 Lip to automatically extend and lock in position.

.4 Release control station button, ramp descends.

.5 Dock leveller to float down to and rest freely on track bed.

.6 When truck pulls away from above dock level position, dock ramp to automatically return to cross traffic position and lip automatically return behind bumpers.

.7 To lower dock ramp below cross traffic position, activate control station button to raise dock ramp above cross traffic position. Manually operate lever to pull front plate beyond stop hooks to cut out automatic return, dock ramp descends to bottom of travel without lip extension and stops.

.8 When truck pulls away from below dock level position, activate control station button to raise dock ramp above cross traffic, release control button, ramp descends to cross traffic position.

3.3 **TEST**

.1 Conduct factory tests under load capacity and submit test results in writing to Departmental Representative before shipping ramp to site.

.2 Operate dock to limits of travel.

.3 Demonstrate out-of-level compensation on bed of variety of trucks and trailers.

.4 Demonstrate mechanical or hydraulic safety fuse.

END OF SECTION

PART 1 General

1.1 RELATED SECTIONS

.1 Section 11 40 20 Food Service Custom Equipment.

.2 Section 11 41 10 Walk-in Freezers and Coolers.

1.2 REFERENCES

.1 American Iron and Steel Institute (AISI)

.2 American National Standards Institute (ANSI)

.1 ANSI Z83.21-2005/CAN/CSA-C22.2 No.168-2005, Commercial Dishwashers.

.3 American Society for Testing and Materials International (ASTM)

.1 ASTM A167-99(2004), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM A240/A240M-07e1, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels, and for General Applications.

.4 Canada Green Building Council (CaGBC)

.1 LEED Canada-NC Version 2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.

.5 Canadian Standards Association (CSA International)

.1 ANSI Z83.21-2005/CAN/CSA-C22.2 No.168-2005, Commercial Dishwashers.

.2 CSA C22.2 No.109-M1981(R2004), Commercial Cooking Appliances.

.3 CAN/CSA-C22.2 No.120-M91(R2004), Refrigeration Equipment.

.4 CAN/CSA-C22.2 No.150-M89(R2004), Microwave Ovens.

.5 CSA C22.2 No.195-M1987(R2004), Motor Operated Food Processing Appliances (Household and Commercial).

.6 CAN/CSA-C388-M89(R2001, Energy Consumption Test Methods for Household Microwave Ovens.

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

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

1.3 SUBMITTALS

.1 Provide submittals in accordance with Division 1 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 LEED Submittals: in accordance with LEED Canada and Division 1 - LEED Requirements.

.4 Quality control submittals: submit following in accordance with Division 1 - Quality Control.

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

.2 Manufacturer's Field Reports: submit manufacturer's written reports within 3 [three] 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 all equipment for incorporation into manual specified in Division 1 - Closeout Submittals.

1.4 QUALITY ASSURANCE

.1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning on-site installation, with contractor's representative and PWGSC Representative in accordance with Division 1 - Construction Progress Schedule - Critical Path Method (CPM), Construction Progress Schedule - Bar (GANTT) Chart.

1.5 ACCEPTABLE SUPPLIERS

.1 Food Service Equipment as specified shall be manufactured and installed by a company having personnel skilled in installing food service equipment and having continuous proven experience within last five years. Owner supplied equipment must be installed and commissioned/demonstrated by the Manufacturer or by a Contractor approved by the Manufacturer or named on the manufacturer’s preferred installer list.

1.6 WORK INCLUDED

.1 Equipments: Work to be carried out includes labour, materials, transport, the installation and the cleaning of the equipment and all the work described and/or shown in the plans and specifications including, without however limiting itself to it strictly:

.2 PLUMBING:

.1 Supply and install all faucets for sinks and for kettles, as well as all plumbing accessories such as pressure release valves, valves, and steam control valves.

.2 Open Drains: Extend all open drains and relief valves to funnel floor drains. Provide access to all drain lines, condensate evaporators and funnel drains.

.3 Pressure Regulating Valves: Supply any required water or steam pressure regulating valves (as per codes) for connection by the Plumbing Contractor.

.4 Low Water Protection: Supply and install low water protection on equipment with sub-merged heating elements.

.5 Concealed all piping and plumbing accessories as much as possible.

.6 Chrome plate exposed piping and fittings.

.7 Supply and install all drains for all sinks. Supply and install corner drains c/w stainless steel removable overflow and a stainless steel removable and perforated corner guard.

.3 ELECTRICAL

.1 Motor Starters: Supply and install motor starters with thermal overload protection for all motors

.2 Electrical Cords: Supply and install all necessary cords and plugs to match respective receptacles.

.3 Standards: Refer to the Electrical Division Specifications for electrical outlets and wiring devices. Provide all wiring and devices to the standard specified in the Electrical Division Documents, or Grade I /Hospital Grade devices as a minimum standard.

.4 GENERAL

.1 Coordination: Coordinate the size and dimensions of all equipment with concerned trades. Ensure that all equipment can be delivered and installed in the location shown on the Drawings.

.2 Permits: Obtain and pay for all permits required by the local codes, at no additional cost to the Contract.

.3 Service Panels: Provide all required access and service panels required to inspect and maintain the equipment.

.4 Piping: Supply and install all piping, refrigeration lines and syrup lines, or any piping required to install the equipment.

.5 Accessories: Supply all standard accessories normally supplied with the equipment by the manufacturer.

.6 Not used.

.7 Metric Graduation: Supply equipment with dials, gauges, etc., graduated in the International Metric System.

.8 Fitting Strips: Supply and install a stainless steel strip with welded joints for all gaps between items of equipment, or between equipment and walls, larger than 3 mm.

.9 Trim Fittings: Supply and install stainless steel trim around all openings in walls.

.10 All equipment is to be Engineered and installed to withstand seismic forces.

1.7 WORK BY OTHER TRADES

.1 Plumbing

.1 Supply and install drain, water, and steam services from the building services to the connection point on the equipment. Connect the equipment. Include, without being limited to the following:

.1 Water: Hot and cold water lines, shock absorbers, any required temperature and/or pressure gauges, shut-off valves, etc. Install pressure-regulating valves supplied with equipment and/or by Division 11.

.2 Drains: Drain lines, connected drains for equipment, connected drains for floor pans, floor drains with funnels for open drains on equipment, general floor drains, traps, vent piping, grease traps (as required by Code).

.3 Chrome Plating: Use chrome plated piping where exposed.

.4 Fittings: Install plumbing fittings and fixtures supplied with equipment.

.5 Interconnect: Interconnect between dishwasher and booster; supply and install all required piping and fittings.

.2 Ventilation

.1 Supply and install all ventilation equipment, ductwork, controls, and accessories required for the exhaust system, including, without being limited to the following:

.1 Ductwork: Supply and install watertight ductwork leading to hood collars, and connect to collars with watertight connections.

.2 Fan Motors: Supply and install exhaust fan motors for exhaust hoods, complete with magnetic starters equipped with holding coils and transformers.

.3 Electrical:

.1 Supply and install all wiring and electrical devices as specified below, or as required. Connect between building service panels and food service equipment, including, without being limited to the following:

.1 Wiring: Connect wiring to the junction boxes, circuit breaker panels or plug receptacles installed on the equipment.

.2 Exhaust Hoods: Wire from the control panel to the junction box of each exhaust hood with automatic wash; and from the control panel to the magnetic contactor of the fan motor for each hood. Interconnect the control panel for the hoods to the remote alarm panel. Wire to a junction box on each exhaust hood section for lighting, and connect to a conveniently located wall switch.

.3 Disconnect Switches: Supply and install all required disconnect switches, including disconnect switches for each condensing unit. Wire from the disconnect switches to the equipment.

.4 Finishes and Floor Depressions

.1 Floor Depressions: Provide floor depressions where specified for Food Service Equipment. Leave a smooth, levelled surface in all floor depressions at the specified depth. Fill in all spaces around the exterior of the floor depression once the equipment has been installed.

.5 General

.1 Sleeves: Provide sleeves in walls, floors and ceilings for all mechanical and electrical services and for all refrigeration lines. Seal around all openings.

1.8 DISCREPANCIES

.1 Verify all Tender Documents and inform the PWGSC Representative, in writing, of all discrepancies, errors, omissions, and ambiguities. Unreported discrepancies will be evaluated at the discretion of the PWGSC Representative.

.2 Conform to all Federal, Provincial, and Municipal regulations, without additional cost to the Contract.

1.9 APPROVALS

.1 Ensure that all equipment installed is CSA approved, and that all items of equipment comply with the latest, and all regulations.

.2 If the equipment supplied is not C.S.A. approved, obtain a local approval at no extra cost to the Contract.

1.10 OPERATING INSTRUCTIONS

.1 Provide required operating and maintenance instructions as specified in Division 1.

1.11 WARRANTY

.1 Issue a written warranty for the period of one (1) year from the date of commissioning for all new equipment. Adhere to all extended warranty periods offered by equipment manufactures beyond the one-year period.

.2 Repair and/or replace all parts and any defective equipment within the warranty period. Provide parts and labour at no cost to the Owner.

PART 2 Products

2.1 MATERIALS

.1 All products to comply with the Canadian Food Inspection Agency approvals.

.2 Stainless steel: ASTM A167 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip. Type 304 cold rolled with AISI no. 4 finish.

.3 Nickel/chromium Coating: to ASTM B456, SC 3 bright finish.

.4 Wire Shelves: stainless steel with 3 mm diameter wire and 8 mm wire framing. Spacing between wires 15 mm. All corners rounded. Welds polished smooth.

.5 Aluminium: Aluminium Association Alloy - AA3003H14.

2.2 HARDWARE

.1 Scope: Supply and install all required hardware to properly finish any item of equipment, and/or as specified.

.2 Shelf supports: Stainless steel with 20 mm wide slots. Adjustable on 13 mm centres. Stainless steel clips.

.3 Locks: flush mounted barrel type with two sets of keys. Key locks alike within departments, and differently between departments.

.4 Casters: heavy-duty, non-marking rubber wheel, permanently bonded to core. Rust resistant nickel-plated bodies. Double ball-bearing raceways. Capacity: 100 kg minimum per caster. All casters to be cart washable type, with bearing seals and grease nipples on raceways and on hollowed axles. Lubricate casters with appropriate lubrication for the environment in which they will be used.

.5 Bumpers: coordinate bumpers on all items of equipment to match. Continuous, heavy-duty strip bumper, complete with metal insert, on all purchased or custom manufactured mobile equipment. 30 mm wide x 25 mm thick.

.6 Electrical Accessories: Equip all items of purchased equipment with grounded, hospital grade fixtures. Install watertight covers in wet areas.

.7 Light Fixtures: Provide lighting fixtures complete with “slimline”, 25 mm dia. fluorescent tube with plastic safety shield, stainless steel reflector, remote ballast in a ventilated and accessible location, switch and starters; all wired to a junction box or circuit breaker panel.

.8 Plumbing Accessories:

.1 Countertop Faucets: Chrome plated brass. Commercial quality with built-in stops. Mixing faucet for hot and cold water. Crosspiece elevated above counter top to facilitate cleaning. Complete with 208 mm nozzle and wrist-action handles.

.2 Backsplash Mounted Faucets: Chrome plated brass. Commercial quality with built-in stops. Mixing faucet for hot and cold water. Complete with 208 mm nozzle and wrist-action handles.

.3 Pot Sink Faucets: Chrome plated brass. Commercial quality with built-in stops. Mixing faucet for hot and cold water. Complete with 305 mm nozzle and wrist-action handles.

.4 Wall Mounted Faucets: Chrome plated brass. Commercial quality with built-in stops and vacuum breaker. Mixing faucet for hot and cold water. Complete with threaded nozzle and pail hook. Support brace fixed to wall.

.5 Sanitizing Stations: Chrome plated brass. Commercial quality with built-in stops. Single hot water only. Threaded short nozzle for connection to hose.

.6 Retractable Hose Reels: Retractable reel with stainless steel cover and 15 meter long hose. Complete with squeeze type spray valve with knife-action spray pattern. Chrome plated mixing valve for wall mounted installations, or concealed type for counter mounted installations. Chrome plated shut-off valve and vacuum breaker. Two brass`check valves.

.7 Drains: Chrome plated brass fixtures, 40 mm or 50 mm diameter. Corner type drains with removable stainless steel standpipe overflow. Removable stainless steel perforated corner guard.

2.3 EXHAUST HOODS

.1 Requirements: Provide exhaust hoods over cooking equipment and over vapour producing equipment. Hoods complete with capture jet technology. Co-ordinate the exact size and placement of duct take-off collars and all related requirements with the Mechanical Division.

.2 Internal Wiring: Supply hood complete with internal wiring for lighting and damper controls, connected to a junction box on top of the hood.

.3 Hanging Devices: Provide all necessary hanging devices for the hoods.

.4 Closure Panels: Provide removable enclosure panels to enclose all hoods to the ceiling. Matching stainless steel panels from the top of the hood to 100 mm above the finished ceiling and all required support lips and ceiling channels.

.5 Demand Control System: Provide a demand control system for the automated regulation of exhaust air volume to exhaust hood Items 85A and 85B. The system is to come equipped with hood mounted infrared cooking activity sensors capable of measuring appliance surface temperatures. Infrared sensor will read appliance surface temperature which will be translated by the specific calculation algorithm for that appliance and will respond proactively to any change in cooking status. Infrared sensor and exhaust collar mounted temperature sensor work in concert on differential temperature reading back to the controller. The system is to also come equipped with a utility cabinet and VFD(s) to control fan speeds. The demand control system shall automatically control the speed of the exhaust fan (and supply fan if applicable) based on appliances status, cooking activities and exhaust air temperatures. The system can be controlled with either manual On/Off switch, a 24 hour automated schedule with a manual override function, or the hoods can be automatically regulated based on the appliance status. The integrated PLC will analyze signals from the cooking activity sensors, temperature sensors and pressure transducers mounted in the hood and then send a signal to the VFD to adjust the exhaust fan (and supply fan if applicable) speed to satisfy current cooking load conditions. The system can be monitored and controlled with an internet connected PC from either a local or

remote location. The system shall include automatic balancing dampers at each hood duct collar to modulate exhaust air volume based on the cooking load under each individual hood section. Mechanical Division will be responsible for wiring between the control panel and the hood mounted sensors. Mechanical Division will also be responsible for wiring between the control panel and the VFD's and then from the VFD's to the exhaust/supply fan motors. The system manufacturer is to provide inter-connectivity cables between the hoods and associated control panels. The system manufacturer is to provide a room temperature sensor. The electrician to provide labour to run cables and required control power per submittal drawings. Field start-up to be performed by a technician so authorized by the system manufacturer. A duct mounted temperature sensor only system will not be permitted. A duct mounted temperature sensor in conjunction with a smoke detector or opacity sensor will not be permitted.

2.4 FIRE EXTINGUISHING SYSTEM

.1 Requirements: Provide type "K" fire extinguishing systems for total surface protection of all cooking surfaces. Fully functional system, ready to operate, complete with bottles, piping and fittings. All exposed piping chrome plated. Fit all nozzles with grease caps. Piping to follow structural members supporting the exhaust hoods.

.2 Micro-switch: Equip all systems with a double pole micro-switch to shut off power to equipment, and to send a signal to the remote fire panel

.3 Remote Pull Stations: Provide a remote fire pull station for each fire extinguishing system. Locate stations on site.

.4 Cover: Provide a painted or stainless steel cover to enclose the bottles and all exposed piping to the ceiling or wall. Front of enclosure to be transparent where required for inspection of gauges.

.5 Regulations: Conform to the "Underwriters' Laboratories of Canada" homologation rules, "N.F.P.A. 96", CAN/CGA-B149, the "Canadian Underwriters' Association", and local authorities.

.6 Provide type "K" hand-held fire extinguishers at all cooking locations as required by N.F.P.A. and as identified by the CFFM/Wing. Supply one extinguisher for each exhaust hood containing an automatic fire extinguishing system (one only for back-to-back hoods over cook tank). Determine location on site with the Base Fire Marshall.

2.5 ITEMIZED EQUIPMENT

.1 General Notes:

.1 Refer to the above clauses of General Specifications that form part of the requirements for each standard made of equipment.

.2 Refer to all of the following clauses for specific details related to both standard made items of equipment.

.2 Supply and install the following equipment:

#	Qty	Description
1	1	High-Density Storage System on Rails
Dimensions:		Overall 7030 mm x 1829 mm x 1980 mm high. Shelves 610 mm wide.

Type:	High-Density floor track system.
Features:	Heavy duty shelving with three tracks per double-depth.
Shelves:	Complete with five-tier fixed shelves at ends and five-tier mobile shelves. Heavy duty polyester/polytetrafluoroethylene coated wire shelving with marine edges for rigidity on front & back. Support frame front and back, and with two cross-rod supports along full length of each shelf. Complete with 4 fixed and 18 mobile shelves, each 915 mm x 610 mm wide.
Construction:	Heavy Duty polyester/polytetrafluoroethylene coated wire shelving with coatings of zinc, chrome, cathodic primer and polyester/polytetrafluoroethylene coated. Ten-year warranty against corrosion.
Posts:	Four (4) 25 mm polyester/polytetrafluoroethylene coated tubes, 1.3 mm thick, per unit. Posts notched every 25 mm for shelf adjustment. Polyester/polytetrafluoroethylene coated cap on top of posts.
Locking Mechanism:	Easily adjustable polyester/polytetrafluoroethylene coated bracket fits notches on posts.
Floor Tracks:	Heavy-duty style with raised projection on floor glides.
Services:	No services.

#	Qty	Description
2		Spare Number

#	Qty	Description
3	22	Dunnage Racks

Dimensions:	Eight (8) 915 mm x 460 mm x 1980 mm high. Fourteen (14) 1220 mm x 460 mm x 1980 mm high.
Construction:	Heavy Duty wire shelving with coatings of zinc, chrome, cathodic primer and polyester/polytetrafluoroethylene coated. Ten-year warranty against corrosion.
Shelves:	Four (4) adjustable shelves per unit. Heavy-duty Polytetrafluoroethylene-coated wire shelving with marine edges for rigidity on front & back. Support frame front and back, and with two cross-rod supports along full length of each shelf.
Casters:	Four 125 mm dia swivel casters per unit.
Services:	No services.

#	Qty	Description
4		Spare Number

#	Qty	Description

#	Qty	Description
6	8	Angle Rack

Dimensions: 505 mm x 710 mm x 1705 mm high.

Construction: Corner posts 38 mm x 38 mm, aluminium, "U" shaped. Twelve (12) sets of adjustable aluminium angles, spacing 63 mm, to receive one (1) 457 mm x 660 mm pan or two (2) 356 mm x 457 mm trays. Four (4) swivel casters 127 mm diameter with ball bearings. Wrap-around bumper. Brakes on two (2) wheels. Inboard casters.

Services: No services.

#	Qty	Description
7		Spare Number
9		Spare Number

#	Qty	Description
10	2	Cook-chill tilting kettle 100 gal, with non tilt-out agitator (BY OWNER)

Scope: Obtain from Owner and install this item according to manufacturer's instructions.

Services: Verify with Owner.
7.8 Amp – 208 v – 3 phase direct connection.
19 mm hot water
19 mm cold water.
25 mm steam
19 mm steam return

#	Qty	Description
11	1	Utility raceways to support Cook Kettles and pump stations (BY OWNER)

Scope: Obtain from Owner and install this item according to manufacturer's instructions.

Services: Verify with Owner.
30 Amp – 208 v – 3 phase direct connection.

#	Qty	Description
12	1	Kettle control panel on pedestal (BY OWNER)

Scope: Obtain from Owner and install this item according to manufacturer's instructions.

Services: Verify with Owner.
30 Amp – 208 v – 3 phase direct connection.

#	Qty	Description
17		Spare Number
18		Spare Number
19		Spare Number
20		Spare Number
22		Spare Number
23		Spare Number
24		Spare Number
25		Spare Number

#	Qty	Description
26	1	Rapid product chiller/cook tank 500 lbs capacity (BY OWNER)

Scope: Obtain from Owner and install this item according to manufacturer's instructions.

Services: Verify with Owner.
20 Amp – 208 v – 3 phase direct connection.
19 mm hot water.
19 mm cold water.
19 mm steam.
19 mm steam return.
50 mm drain.
Refrigeration lines to Item #40.

#	Qty	Description
27		Spare Number

#	Qty	Description
28		Spare Number

#	Qty	Description
31	1	Vegetable processor

Dimensions: 590 mm x 430 mm x 1246 mm high

Type: Rotary vegetable cutter mounted on four (4) stainless steel legs. All stainless steel construction. Powered by 4 hp motor.

Capacity: 1,200 lbs vegetables per hour

Features: Two speed motor 425 or 850 rpm controlled by side mounted control panel with push-type buttons.
Magnetic safety switch.
Two (2) processing discs.

Options: Bulkfeed assembly with French fry capability.
Six (6) additional blades as selected by the operator.

Services: 10 Amp – 208 v – 1 phase outlet on wall.
Floor drain.

#	Qty	Description
32	1	Mobile pump/fill station (BY OWNER)

Scope: Obtain from Owner and install this item according to manufacturer's instructions.

Services: Verify with Owner.
10 Amp – 208 v – 1 phase outlet on wall
Compressed air inlet.

#	Qty	Description
33	1	Vacuum clipper w/vertical vacuum nozzle

Scope: Obtain from Owner and install this item according to manufacturer's instructions.

Services: Verify with Owner.
6 amp – 208 volt – 1 phase electric outlet on wall.
Compressed air inlet.

#	Qty	Description
34	1	Cart for Vegetable Processor

Type: Stainless steel food tray cart. Four swivel casters.

Features: Tubular stainless steel frame to support full size food box (R198).

Accessories: 6 x food boxes.

Services: No services.

#	Qty	Description
36		Spare Number
37		Spare Number
38		Spare Number
39		Spare Number

#	Qty	Description
40	1	Air cooled remote refrigeration package for chill tanks (BY OWNER)
Scope:		Obtain from Owner and install this item according to manufacturer's instructions.
Services:		Verify with Owner. 60 Amp – 208 v – 3 phase direct connect = located outside.

#	Qty	Description
41		Spare Number
42		Spare Number

#	Qty	Description
43	1	Grated floor trench with floor drain (at kettles)
Dimensions:		One (1) 3531 mm x 787 mm x 203 mm deep.
Type:		Self-washing, clog-free with high-capacity full-length strainer tray. Strainer perforations to catch food particles as small as one grain of rice.
Features:		Clog-free technology. Sides sloped a minimum of 10° to the bottom of the trough to direct debris to the full length strainer tray. Depth of the troughs range from 130 mm to 229 mm to accommodate high volume water areas. Grates fibreglass reinforced resin anti-slip with an integral flex built in to provide anti-fatigue benefit. Grates to be removable and can be cleaned in conveyor or door type dish machines. Weight capacity ranges from 646 kg to 1209 kg per grate.
Construction:		Floor modules to be constructed of 16 gauge stainless steel with 2B finish; designed in compliance and certified with all applicable NSF and NFSI standards. Trough contains grout locking holes spaced every 35 mm around outside perimeter. Trough pan sides to be sloped towards centre collection strainer tray at an angle no less than 10°. Pan to have a 25 mm pitch to end drain. 89 mm end drain to mate to 76 mm no hub connection to grease interceptor. Trough to include 4-6 threaded levelling legs to ease installation process. Full length stainless steel strainer trays to have 2 mm perforated, slotted opening pattern with handles on both ends. Walking surface to be fibreglass reinforced resin anti-slip grating with integral flex to provide anti-fatigue benefit. No slip grate coating to be alumina grit.
Accessories:		Seven (7) anti-slip, heavy-duty fibreglass floor grates with lock-down accessory. Pressurized Tank. Solenoid. Timer. Transformer. Waterproof box.
Services:		25 mm cold water. 88 mm drain connected to grease trap. 241 mm deep floor depression.

#	Qty	Description
43A	2	Grated floor trench with floor drain (at cook chill tank)
Dimensions:		One (1) at 2537 mm x 784 mm x 204 mm deep. One (1) at 2037 mm x 784 mm x 204 mm deep.
Type:		Self-washing, clog-free with high-capacity full-length strainer tray. Strainer perforations to catch food particles as small as one grain of rice.
Features:		Clog-free technology. Sides sloped a minimum of 10° to the bottom of the trough to direct debris to the full length strainer tray. Depth of the troughs range from 130 mm to 229 mm to accommodate high volume water areas. Grates fibreglass reinforced resin anti-slip with an integral flex built in to provide anti-fatigue benefit. Grates to be removable and can be cleaned in conveyor or door type dish machines. Weight capacity ranges from 646 kg to 1209 kg per grate.
Construction:		Floor modules to be constructed of 16 gauge stainless steel with 2B finish; designed in compliance and certified with all applicable NSF and NFSI standards. Trough contains grout locking holes spaced every 35 mm around outside perimeter. Trough pan sides to be sloped towards centre collection strainer tray at an angle no less than 10°. Pan to have a 25 mm pitch to end drain. 89 mm end drain to mate to 76 mm no hub connection to grease interceptor. Trough to include 4-6 threaded levelling legs to ease installation process. Full length stainless steel strainer trays to have 2 mm perforated, slotted opening pattern with handles on both ends. Walking surface to be fibreglass reinforced resin anti-slip grating with integral flex to provide anti-fatigue benefit. No slip grate coating to be alumina grit.
Accessories:		Eleven (11) anti-slip, heavy-duty fibreglass floor grates, total for both units. Pressurized Tank. Solenoid. Timer. Transformer. Waterproof box.
Services (Each Unit):		25 mm cold water. 88 mm drain connected to grease trap. 2419 mm deep floor depression.

#	Qty	Description
44		Spare Number
45		Spare Number
46		Spare Number
47		Spare Number

#	Qty	Description
48		Spare Number

#	Qty	Description
49		Spare Number

#	Qty	Description
50	16	Shelf

Dimensions: Eight (8) 1524 mm x 447 mm x 1980 mm high.
Eight (8) 1067 mm x 447 mm x 1980 mm high.

Construction: Heavy Duty wire shelving with coatings of zinc, chrome, cathodic primer and polyester/Teflon. Ten-year warranty against corrosion.

Shelves: Four (4) adjustable shelves per unit.
Heavy-duty Teflon-coated wire shelving with marine edges for rigidity on front & back. Support frame front and back, and with two cross-rod supports along full length of each shelf.

Services: No services.

#	Qty	Description
51		Spare Number
52		Spare Number
53		Spare Number
54		Spare Number
55		Spare Number
56		Spare Number
57		Spare Number
58		Spare Number
59		Spare Number
60		Spare Number
61		Spare Number
62		Spare Number

#	Qty	Description
64	9	Angle rack

Dimensions: 505 mm x 710 mm x 1705 mm high.

Construction: Corner posts 38 mm x 38 mm, aluminium, "U" shaped. Twelve (12) sets of adjustable aluminium angles, spacing 63 mm, to receive one (1) 457 mm x 660 mm pan or two (2) 356 mm x 457 mm trays. Four (4) swivel casters 127 mm diameter with ball bearings. Wrap-around bumper. Brakes on two (2) wheels. Inboard casters.

Services: No services.

#	Qty	Description
65	5	Garbage container

Dimensions: 899 mm x 693 mm x 1158 mm high.

Capacity: 360 litres.

Construction:
- All-plastic, professional-grade construction.
- Heavy-duty, one-piece construction.
- Strong, hinged lid included.
- Reinforced lift points.
- Reinforced rim.
- Inset wheels.
- Grey

Services: No services.

#	Qty	Description
66		Spare Number

#	Qty	Description
67	1	Power wash sink system

Dimensions: 2769 mm x 764 mm x 915 mm high.

Configuration: Left-to-Right (soiled to clean):
38 mm rolled rim.
510 mm soiled end.
813 wash sink.
510 mm rinse sink.
760 mm clean drain board.
38 mm rolled rim.

Features: Type 304 polished stainless steel construction.
14 gauge stainless tanks and drain boards.
279 mm high x 65 mm deep back splash.
Stainless steel pump and impeller.
Self-draining pump.
Sink front trim panel.
Eight 38 mm diameter wash nozzles.
Removable, welded H frame leg sets and adjustable bullet feet.

Detachable and adjustable height cross rails.
Dual inlet strainers.
Centrifugal pump with 4" diameter intake and3" diameter outlet.
2 H.P. totally enclosed (TEFC) wash pump motor with permanently sealed bearings.
Low water protection for wash pump motor.
Inherent motor overload protection, manual reset.

Options: 19 mm mixing faucets.
Pre-rinse spray.
Electric tank heat.
High-volume wash sink sump with removable strainer.
Auto fill.
Utensil Basket.
Pan Rack.

Services: 20 Amp – 208 v – 3 phase direct connect.
3 x 19 mm hot water.
2 x 19 mm cold water.
2 x 50 mm drain, connect to grease trap.

#	Qty	Description
69	6	Garbage container

Dimensions: 495 mm diameter x 581 mm high.

Capacity: 75 litres.

Construction:
- All-plastic, professional-grade construction.
- Strong, snap-on lidincluded.
- Reinforced rim.
- Built-in handles.
- Double-ribbed base.
- Yellow
- USDA Meat & Poultry Equipment Group Listed.
- Certified to NSF International Std. #2 and Std. #21.

Services: No services.

#	Qty	Description
70	1	Rack conveyor machine with booster

Dimensions: 2184 mm x 635 mm x 1480 mm high.

Type: Two section plus 250 mm prewash section rack conveyor dishwashing machine. High temperature machine with integral booster. Right-to-left operation.

Capacity: 277 racks per hour.

Wash tank: 21 US gallons.

Conveyor speed: 2347 mm/min.

Motor HP: Drive 1/6 HP
Prewash 1 HP
Wash: 2 HP
Rinse: 2 HP

Water Consumption: 565 litres per hour.

Construction: Energy Star Qualified. All stainless steel construction. Dual-pawl cradle drive system. Idle pump shut-off. Automatic tank fill. Door safety switch. Door-activated drain closure. Enclosure panels front and sides. Stainless steel pump and impellers. Dishwasher to be heated with two tank 1626 mm automatic rack type dishwasher with 559 mm pre-wash. The machine will automatically wash and sanitize food service wares when connected to an adequate incoming source of a minimum 54 degree C. fresh water and boost the final rinse to 81 degree C. This machine shall have a final fresh water consumption rate no greater than 1. 661 per rack. The machine will be furnished with two 2 HP wash and a 1 HP prewash pump and a l/6 HP rack conveyor motor with an anti-jam drive system. The dishwashing machine must be ULC and NSF approved and will carry such labels. The direction of operation will be right to left and voltage will be 575/60/3 phase. This machine will have electric tank heat with a 21 degree C rise built-in electric booster. The dishwasher will process a minimum NSF rated 277 racks per hour process a maximum 565 litres water consumption.

Equipment to have one piece stainless steel hood and integral tanks mounted on stainless steel base, legs and feet. The dishwasher will be supplied with full stainless steel rear mounted manifolds. Composite material will not be accepted at any point on the rear manifold. All fresh water connection must be made to copper piping and copper piping is to be supplied to the booster and final rinse system. Stainless steel braided hosing with internal rubber hosing will not be accepted.

Pre-wash section to have minimum 393 mm wide door and a 660 mm wide wash/rinse tank door with a double safety catch and " cool " handle, providing access to the interior of the machine. This door shall lift upright in guide channels that will be within the hood without need for external drip troughs. The machine opening will have a minimum 08mm vertical clearance through the machine to accommodate 457mm X 660 mm sheet pans. Door safety switches will also be provided.

Tank bottoms to extend the full width and depth of their spray area. Removable perforated internal scrap basket with two-piece scrap screens with handles will completely cover tank areas. Free access to all parts of each tank will be possible with refuse screens removed. The machine will have door activated drain closures. Stainless steel front and end enclosure panels will come standard with the machine.

Machine to have one-piece cast stainless steel upper and lower spray arm assemblies in the prewash and wash tanks. The spray arm assemblies will individually removable for ease of cleaning. A thermometer for each tank will be mounted and connected the top mounted console. Sprays will be controlled by a rack activated switch inter-wired to a water solenoid valve. Stainless steel pumps and impellers will also be provided.

Fresh water to fill tank supplied through an automatic fill feature. Piping to the final rinse will be made of copper piping only and complete with vacuum breaker, line strainer, thermometer, and hot water solenoid valve. The pre-wash section will come with an external tank and removable scrap basket.

Prewash section to have external scrap basket to allow easy removal during pauses in machine operation, without having to open the door and reach into the prewash cavity.

Rack conveyor system to accept 508 mm x 508 mm racks without need for guide or index strips or chains. Racks will automatically progress through the machine and ejected by a reciprocating stainless steel dual pawl bar. Pawl bar will be driven by a revolving roller crank directly connected to an oil-sealed, adjustable spring loaded clutch. Drive through the overload torque limiter will be from a gear reduction unit driven by a 1/6 HP, 1750 RPM, standard NEMA motor.

Machine equipped with load and unload vent cowls with vent stack and locking dampers. The equipment will have a stainless steel hood and integral tanks mounted on a full stainless steel base, legs and feet. Stainless steel front and end enclosure panels will come standard with the machine.

Machine to have stainless steel top mounted control panel inter-wired. It will contain an approved magnetic motor starter with automatic resetting overload heater and low voltage protection for each motor. A stainless steel “Piezo" start/stop button and tank heat indicating pilot light will be mounted on front of enclosure. A water tight rocker power switch must be supplied standard. An energy sentine l (idle pump shut off) and final rinse saver device will a l so be provided. The machine will also come equipped with a vent fan control feature in the top mounted control cabinet.

The 2184 mm dishwasher supplied with 180 degree unloading system and 1095 mm unload roller table with flanged feet. This drive unloading system shall be no greater than 1828 mm x 1914mm in size and be supplied with drain. The 1095 mm shall be supplied with secured roller sections and table limit switch.

All components supplied with maximum security package. Package to include tamper screws, locking hasps each door, stainless steel grid over control cabinet, weld-in curtains (non - removable), hinged prewash bucket, rotective mesh under machine, locking spray arms, exposed metal conduit.

Include one year parts and labour warranty. Electric tank heat /booster dishwasher will come fully equipped with a common hot water connection, a common drain connection and two-point electric connection, and a 500/60/3 control circuit.

Features: Top-mounted control cabinet. Upper and lower one-piece stainless spray arm assemblies. Removable internal scrap baskets with two-piece strainers. 26” wide front doors with double-lock latches. 15.5” leak-proof pre-wash door. Anti-jam conveyor drive system.

Accessories:
Electric tank heat.
Electric 70 degree rise water booster with field-replaceable elements.
Table limit switch.
Water hammer kit.
Drain tempering kit.
Splash shield at exit only.

Services:
32 Amp – 575 volt – 3 phase direct connect.
24 Amp – 575 v – 3 phase direct connect (booster).
13 mm cold water.
19 mm hot water.
2 x 50 mm drain connected to common manifold, connect to grease trap.
2 x duct collar 104 x 408 mm, one at 189 l/sec and one at 71 l/sec.

Qty Description

71		Spare Number

#	Qty	Description
72	1	Clean Dish Roller Table
Dimensions:		1118 mm long.
Type:		All stainless steel, constructed to match dishwasher, by manufacturer of dishwasher.
Features:		Tubular legs cross-bars and basket support rails under table top.
Services:		Floor drain.

#	Qty	Description
73		Spare Number
74		Spare Number
75		Spare Number
76		Spare Number

#	Qty	Description
78	8	Heavy duty angle rack • 18 pans capacity
Dimensions:		505 mm x 710 mm x 1705 mm high.
Construction:		Corner posts 38 mm x 38 mm, aluminium, "U" shaped. Eighteen (18) sets of aluminium angles, to receive one (1) 457 mm x 660 mm pan or two (2) 356 mm x 457 mm trays. Four (4) swivel casters 127 mm diameter with ball bearings. Wrap-around bumper. Brakes on two (2) wheels. Inboard casters.
Services:		No services.

#	Qty	Description
79	5	Stainless steel utility cart
Dimensions:		815 mm x 610 mm x 984 mm high.
Type:		Heavy duty, all welded stainless steel cart. Three shelves. 800 lb. Capacity.
Construction:		Type 304 stainless steel, #4 finish. One-piece corner uprights. Heli-arc welded construction. Bumpers on all corners and handle. 125 mm swivel casters, all with brakes. Sealed casters with grease fittings.

Services: No services.

#	Qty	Description
80		Spare Number
81		Spare Number
82		Spare Number
83		Spare Number
84		Spare Number

#	Qty	Description
85A	1	Exhaust Hood (Kettles)

Dimensions: 4216 mm x 2134 mm x 610 mm high.

Type: Low-volume exhaust hood employing low-velocity capture-jet streams to assist capture of heat and vapour-laden air produced under the hood.

Exhaust Air Volume: 967 l/sec.

Duct Sizes: 2 @ 279 mm x 203 mm.

Features:
- Highly efficient technology reduces the exhaust airflow volume required.
- Heat load design method.
- ASTM 1704 validated performance.
- Stainless steel 'Multi cyclone' high efficiency grease filters - UL and NSF classified.
- T.A.B. (testing and balancing) ports, which allow accurate and effective commissioning.
- Standard LED light fixtures.
- Stainless steel welded construction.

Construction: The exposed part of the hood in 18 ga. stainless steel. The joints of the inner liner with fully welded construction. The hood ends have double side wall construction. The capture air flow is introduced through a special discharge panel. Grease and dirt extracted by the multi-cyclone filter can be removed from the hood by emptying the collection tray. The air flow through the capture air chamber is determined by the T.A.B. ports located inside the upper hood chamber. Include stainless steel filler pieces to enclose hood to wall on ends and bottom.

Capture System: The hood shall be designed with capture technology to reduce the exhaust airflow rate required, and to improve the capture and containment efficiency of the hood, while reducing energy consumption. The capture air shall be introduced through a special discharge panel and shall not exceed 10% of the calculated exhaust airflow. The capture discharge velocity will be a minimum of 1500 feet per minute. Slot or grille type discharge shall not be used. The capture system shall be internally mounted with a speed control and will not require a fire damper or electronic shut down in fire mode.

Grease Filters: The hood shall be equipped with multi-cyclone stainless steel grease extractors. The filters shall be NSF and UL classified. The grease extraction efficiency is 93% on particles with a diameter of 5 microns and 98% on particles with a diameter of 15 microns

or larger as tested by an independent testing laboratory. The pressure loss over the extractor shall not exceed 0.50" of water at flow rates approved by U.L. for heavy load cooking. Sound levels shall not exceed an NC rating of 55. Baffle or slot type extractors shall not be used.

Demand Control System: Refer to Paragraph 2.3.5.

Light Fixtures: Hood lights shall be U.L. Listed LED fixtures, suitable for grease hoods. 20 Watts per fixture, 50 foot candles at cooking surface. The lighting shall be suitable for single phase power supply.

Control Panel: The master electrical panel consisting of one starter per motor with overload protection will be supplied. Control panel to hood or remote mounted. The control panel is connected to the electrical box of the fan via a relay which detects any electrical fan failures. The system will not operate, if the fan does not work.

Services: 10 Amp – 120 v – 1 phase direct connect from ceiling.
967 l/sec exhaust.

#	Qty	Description
85B	2	Exhaust Hood (Cook Tank)

Dimensions: 3048 mm x 3048 mm x 610 mm mm high, consisting of two (2) canopies, each at 3048 mm x 1524 mm x 610 mm high.

Type: Low-volume exhaust hood employing low-velocity capture-jet streams to assist capture of heat and vapour-laden air produced under the hood.

Exhaust Air Volume: 658 l/sec. for each section.

Duct Sizes: 150 mm x 255 mm.

Features:
- Highly efficient technology reduces the exhaust airflow volume required.
- Heat load design method.
- ASTM 1704 validated performance.
- Stainless steel 'Multi cyclone' high efficiency grease filters - UL and NSF classified.
- T.A.B. (testing and balancing) ports, which allow accurate and effective commissioning.
- Standard LED light fixtures.
- Stainless steel welded construction.

Construction: The exposed part of the hood is made of stainless steel. The joints of the inner liner have a fully welded construction. The hood ends have double side wall construction. The capture air flow is introduced through a special discharge panel. Grease and dirt extracted by the multi-cyclone filter can be removed from the hood by emptying the collection tray. The air flow through the capture air chamber is determined by the T.A.B. ports located inside the upper hood chamber. The exposed parts are manufactured from 18 ga. stainless steel

Capture System: The hood shall be designed with capture technology to reduce the exhaust airflow rate required, and to improve the capture and containment efficiency of the hood, while reducing energy consumption. The capture air shall be introduced through a special discharge panel and shall not exceed 10% of the calculated exhaust airflow. The capture discharge velocity will be a minimum of 1500 feet per minute. Slot or grille type discharge

shall not be used. The capture system shall be internally mounted with a speed control and will not require a fire damper or electronic shut down in fire mode.

Grease Filters: The hood shall be equipped with multi-cyclone stainless steel grease extractors. The filters shall be NSF and UL classified. The grease extraction efficiency is 93% on particles with a diameter of 5 microns and 98% on particles with a diameter of 15 microns or larger as tested by an independent testing laboratory. The pressure loss over the extractor shall not exceed 0.50" of water at flow rates approved by U.L. for heavy load cooking. Sound levels shall not exceed an NC rating of 55. Baffle or slot type extractors shall not be used.

Demand Control System: Refer to Paragraph 2.3.5.

Light Fixtures: Hood lights shall be U.L. Listed LED fixtures, suitable for grease hoods. 20 Watts per fixture, 50 foot candles at cooking surface. The lighting shall be suitable for single phase power supply.

Control Panel: The master electrical panel consisting of one starter per motor with overload protection will be supplied. Control panel to hood or remote mounted. The control panel is connected to the electrical box of the fan via a relay which detects any electrical fan failures. The system will not operate, if the fan does not work.

Services: 10 Amp – 120 v – 1 phase direct connect from ceiling.
2 at 658 l/sec exhaust.

#	Qty	Description
85C		Spare Number

#	Qty	Description
85D	1	Exhaust Hood (Warewasher)

Dimensions: 2870 mm x 838 mm x 610 mm high.
Features:
- Angled internal baffles and deflectors.
- Efficient exhaust is maintained by using lateral side slots combined with the large internal volume.
- Modular construction simplifies design and installation.
- Manufactured from polished stainless steel, welded design.
- Surface mounted light fixture.

Exhaust Air Volume: 496 l/sec. exhaust.

Duct Size: 279 mm x 203 mm.

Construction: Constructed from 18 gauge stainless steel. Supplied complete with outer casing / main body, inner liner, exhaust duct, baffle plates, condensate channel, drain tap and assembly brackets. Outer casing panels shall be constructed of stainless steel with a brushed satin finish. Each joint shall be welded and liquid tight, avoiding harmful dripping of condensation. All exposed welds are ground and polished to the original finish of metal.

Baffle plates: Condensation is achieved by the use of angled internal baffles and deflectors. Efficient exhaust is maintained by using lateral side slots combined with the large internal volume.

Incandescent light: Surface mount vapour proof light fixture. The lighting shall be suitable for single-phase power supply and shall be UL listed incandescent type, suitable for condensate hoods.

Condensate Channels: Condensate channels guttering shall form part of the main construction of the canopy and run the entire perimeter of the hood.

Drain Tap: The drain tap shall be manufactured from stainless steel.

Services: 10 Amp – 120 v – 1 phase direct connect from ceiling.
496 l/sec exhaust.

#	Qty	Description
85E	1	Exhaust Hood (Pot Sink)

Dimensions: 3200 mm x 1220 mm x 610 mm high.

Features:
- Angled internal baffles and deflectors.
- Efficient exhaust is maintained by using lateral side slots combined with the large internal volume.
- Modular construction simplifies design and installation.
- Manufactured from polished stainless steel, welded design.
- Surface mounted light fixture.

Exhaust Air Volume: 445 l/sec exhaust.

Duct Size: 255 mm x 203 mm.

Construction: Constructed from 18 gauge stainless steel. Supplied complete with outer casing / main body, inner liner, exhaust duct, baffle plates, condensate channel, drain tap and assembly brackets. Outer casing panels shall be constructed of stainless steel with a brushed satin finish. Each joint shall be welded and liquid tight, avoiding harmful dripping of condensation. All exposed welds are ground and polished to the original finish of metal.

Baffle plates: Condensation is achieved by the use of angled internal baffles and deflectors. Efficient exhaust is maintained by using lateral side slots combined with the large internal volume.

Incandescent light: Surface mount vapour proof light fixture. The lighting shall be suitable for single-phase power supply and shall be UL listed incandescent type, suitable for condensate hoods.

Condensate Channels: Condensate channels guttering shall form part of the main construction of the canopy and run the entire perimeter of the hood.

Drain Tap: The drain tap shall be manufactured from stainless steel.

Services: 10 Amp – 120 v – 1 phase direct connect from ceiling.
445 l/sec exhaust.

#	Qty	Description
86	16	Angle rack with Food Bins

Dimensions: 745 mm x 545 mm x 1730 mm high

Construction:
- end loader
- to hold full-size boxes or 28 sheet pans 457 mm x 661 mm.
- safety stops prevent boxes or pan from sliding out accidentally.
- tough polycarbonate panels encase metal uprights.
- heavy-duty strength.
- resist denting warping and rust.
- four (4) 125 mm dia. swivel casters two (2) with brakes.
- removable panels for dishwasher cleaning.

Containers: Clear polycarbonate food-safe and dishwasher-safe.
One (1) full size x 380 mm deep.
One (1) full size x 305 mm deep.
One (1) full size x 228 mm deep.
One (1) full size x 150 mm deep.
Four (4) half size x 150 mm deep.

Services: No services.

#	Qty	Description
87	1	Fire Extinguishing System

Type: Class “K” rated for kitchen fire suppression systems.

Coverage: The fire protection system shall be an integral part with hoods, items #209 & 211.

Construction: The fire protection system shall be an integral part with hoods #85A & 85B. The system shall be activated manually or automatically by fire detectors located in the hoods. In case of fire, the air supply fan shuts off, the air exhaust fan stays on. All grease extractors shall be sprayed with water and cooking appliances and duct collars with wet chemical. All power sources to any appliances located under the hoods shall shut off and a warning signal shall be activated.

The system shall be ready to operate to the satisfaction of the Owner. The equipment and the installation shall be in accordance with ULC, NFPA 96 and NFPA-17-A. The supplier shall complete required tests to demonstrate the good working of the system. This system shall be completed with all the required accessories for a perfect operation, including piping, chrome-plated finish under the hoods, injectors of liquid, ULC listed tight rings to seal holes in the hood for fire extinguishing piping, wall brackets and stainless steel enclosure for cylinders, wall handle for manual activating and one double micro-switch for electrical connections. Provide all necessary holes in walls, floors or ceilings as required for internal connections of these systems. Coordinate the work with all other trades, preventing all damage to any other material concealed inside walls, ceilings or floors. Provide two (2) hand-held Class “K” fire extinguishers.

Division 26: Provide the magnetic contactors or shunt trip mechanisms and connect them to the control panel to automatically cut off electrical supply of all cooking equipment located under the hoods, and connect micro-switch to the building alarm system.

Note: Piping to follow structural members supporting the exhaust hoods.

Services: 10 amp – 120 volt, direct connect at bottle.

#	Qty	Description
88		Spare Number

PART 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

.1 Install equipment in accordance with manufacturer's instructions. Perform all Work to state-of-the-art practices. Ensure that all Work is square and plumb, properly positioned and lined up, and fixed in place.

.2 Co-ordinate connection of mechanical and electrical services.

.3 Adjust equipment for smooth and proper operation.

.4 Provide a competent site supervisor with a minimum of five (5) years of experience in food service equipment installation.

.5 Cutting: Provide all necessary holes and access to accommodate work of mechanical and electrical trades.

.6 Provide clearances, access, access panels, ventilated panels and all other considerations required for a proper installation of all equipment.

.7 Interconnect between water coolers and dispensers. Insulate water lines and install a shock absorber before the dispenser.

.8 Extend all open drains to funnel floor drain. Provide access to all drainlines, vaporizers and funnel drains.

.9 Fix permanent equipment to floors, and seal to the floors to prevent access to vermin and moisture. Where equipment is located against walls, seal equipment to the walls. Seal between items of equipment.

.10 Once all equipment has been installed remove protective coverings and clean all equipment. Test and adjust operation of all equipment. Adjust all doors to close properly.

.11 All equipment is to be installed to withstand seismic forces.

3.3 TESTING

.1 Factory test all items to be sure they are working properly before shipment.

.2 Before commissioning the equipment test all items and all safety devices to ensure their proper functioning under operating conditions. Calibrate all controls and sensors. Balance all refrigeration systems. Test seals on all pressure vessels.

3.4 FIELD QUALITY CONTROL

.1 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.

3.5 COMMISSIONING

.1 Refer to Sections 01 91 00, 01 91 01 and 01 91 41 for Commissioning Requirements.

.2 Provide full commissioning services for all items of equipment provided by the Owner as well as items supplied under Division 11.

.3 Submit a schedule of demonstration by equipment suppliers four (4) weeks prior to Substantial Completion of the Work. List the exact time for each equipment demonstration. Demonstrations to include instruction and training on the proper use and maintenance of equipment. Once the approved schedule is returned, make all necessary arrangements for the demonstration sessions.

.4 Provide required operating and maintenance instructions as specified in Division 1

.5 Submit three (3) bound manuals of operating instructions, maintenance instructions, and spare parts list for each item of equipment. Use numbered tabs to separate numbered/indexed items in the manual. Identify the service company for each item in an appendix to the manuals. Submit manuals at least two (2) weeks prior to the equipment demonstrations during the commissioning phase. Submit copies of As-Built Drawings and Reviewed Shop Drawings.

.6 Provide Start-up Forms and Static Verification Forms and Functional Test Forms as required by Division 1 Specifications. Submit sample forms for approval four weeks prior to the end of installation.

.1 **Sample Static Verification Form:** This form collects the nameplate information of each piece of equipment and verifies that what was specified is what was actually installed.

.2 **Sample Static Verification Form: Sample Start - Up Form:** This form is typically provided by the manufacturer and is essentially a check list of what needs to be verified before a piece of equipment is started for the first time.

.3 **Functional Test Form:** This form itemize the various tests that are required to ensure that the equipment is working properly. The manufacturer may also have one available to use..

END OF SECTION

PART 1 General

1.1 PRODUCTS SUPPLIED AND INSTALLED UNDER THIS SECTION

.1 Exhaust hoods.

.2 Fire suppression systems.

.3 Kettle drain troughs.

1.2 RELATED SECTIONS

.1 Section 11 40 10 Food Service Stock Equipment.

.2 Section 11 41 10 Walk-in Freezers and Coolers.

1.3 REFERENCES

.1 American Iron and Steel Institute (AISI)

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM A167-99(2004), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM A240/A240M-07e1, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.3 ASTM A269-04, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

.4 ASTM A480/A480M-06b, Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.

.5 ASTM B456-03, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.3 Canada Green Building Council (CaGBC)

.1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.

.2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13-M87, Sealing Compound, One Component, Elastomeric, Chemical Curing.

.5 Canadian Standards Association (CSA International)

.1 CSA O112 Series-M1977(R2006), CSA Standards for Wood Adhesives.

.6 Forest Stewardship Council (FSC)

.1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

.2 FSC-STD-20-002-2004, Structure and Content of Forest Stewardship Standards V2-1.

.3 FSC Accredited Certification Bodies.

.7 Green Seal Environmental Standards (GSES)

.1 Standard GS-36-00, Commercial Adhesives.

.8 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.9 National Hardwood Lumber Association (NHLA)

.1 NHLA Rules for the Measurement and Inspection of Hardwood and Cypress 2007.

.10 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168-[05], Adhesives and Sealants Applications.

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

1.4 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: submit drawings stamped and signed by professional engineer registered or licensed in Ontario.

.1 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.

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

.4 LEED Submittals: in accordance with LEED Canada and Division 1 - LEED Requirements.

.5 Quality control submittals: submit following in accordance with Division 1 - Quality Control.

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

.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.

.6 Closeout Submittals:

.1 Provide operation and maintenance data for equipment for incorporation into manual specified in Division 1 - Closeout Submittals.

1.5 QUALITY ASSURANCE

.1 Certification: provide for following wood products, materials produced from wood obtained from forests certified by FSC Accredited Certification Body in accordance with FSC-STD-01-001.

.2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with contractor's representative and PWGSC Representative in accordance with Division 1 - Construction Progress Schedule - Critical Path Method (CPM), and Construction Progress Schedule - Bar (GANTT) Chart to verify project requirements.

1.6 WORK INCLUDED

.1 Equipment: Supply all labour, materials, transportation, installation and cleaning of the food service equipment, including, without being limited to the following:

.1 PLUMBING

.1 Open Drains: Extend all open drains and relief valves to funnel floor drains. Provide access to all drain lines, condensate evaporators and funnel drains.

.2 Low Water Protection: Supply and install low water protection on equipment with submerged heating elements.

.3 Drain Manifold: On hot food tables, interconnect food wells to a common drain manifold and extend manifold to funnel floor drain.

.4 Conceal all piping and plumbing accessories.

.5 Chrome plate exposed piping and fittings.

.6 Waste Outlets: Supply and install waste outlets with tailpieces for all sinks. For sinks with corner drains, install removable stainless steel perforated corner guards and removable standpipes.

.7 Faucets: Supply and install faucets for all sinks.

.2 ELECTRICAL

.1 Motor Starters: Supply and install motor starters with thermal overload protection for all motors

.2 Electrical Cords: Supply and install all necessary cords and plugs to match respective receptacles.

.3 Standards: Refer to Electrical Division Specifications for electrical outlets and wiring devices. Provide all wiring and devices to the standard specified in the Electrical Division Documents, or Grade I /Hospital Grade devices as a minimum standard.

.4 Custom Wiring: Supply all custom fabricated equipment complete with grounded junction boxes or circuit breaker panels. All equipment completely prewired to junction boxes or circuit breaker panels. All wiring shall be in parallel, and shall be concealed.

.5 Identify all circuit breaker panel circuits.

.6 Waterproofing: All electrical plug receptacle devices must be watertight. Install waterproof wiring, controls and control panels in dishwashing and potwashing areas. Use liquid tight conduit for connections to motors.

.7 Plug Receptacles: Supply and install stainless steel casings around exposed electrical plug receptacles on custom fabricated equipment. Recess outlets into counter fronts using stainless steel pans. Install stainless steel faceplates on plug receptacles that are not watertight, such as those in cafeteria serveries.

.8 Lighting Fixtures: Supply and install lighting fixtures complete with “slimline”, 25 mm dia. fluorescent tube with plastic safety shield, stainless steel reflector, remote ballast in a ventilated and accessible location, switch and starters; all wired to a junction box or circuit breaker panel. Conceal wiring for lights and infrared lamps through shelf support uprights.

.9 Installation: Recess all switches, plug receptacles, and all controls. Identify all receptacles and controls with engraved plates.

.3 GENERAL

.1 Coordination: Coordinate the size and dimensions of all equipment with concerned trades. Ensure that all equipment can be delivered and installed in the location shown on the Drawings.

.2 Permits: Obtain and pay for all permits required by the local codes, at no additional cost to the Contract.

.3 Service Panels: Provide all required access and service panels required to inspect and maintain the equipment.

.4 Piping: Supply and install all piping, refrigeration lines and syrup lines, or any piping required to install the equipment.

.5 Locks: Supply and install locks on all drawers, and on all refrigerators and freezers. Supply and install locking devices and locks on ice cream cabinets and freezer display cases.

.6 Metric Graduation: Supply equipment with dials, gauges, etc., graduated in the International Metric System.

.7 Fitting Strips: Supply and install a stainless steel strip with welded joints for all gaps between items of equipment, or between equipment and walls, larger than 3 mm.

.8 Trim Fittings: Supply and install stainless steel trim around all openings in walls for any other item of equipment supplied by this Section.

.9 Access panels: Provide access to all electrical components, lighting ballasts, etc. Provide hinged doors as access to circuit breaker panels. Ventilate access doors for light ballasts or any components that must be cooled.

.10 Finish Edges: Properly finish all edges and corners of equipment so that they are free of sharp edges.

.11 Insulate: Insulate between the top of infrared fixtures and the overshelf from which they are suspended.

.12 All equipment is to be Engineered and installed to withstand seismic forces.

1.7 WORK BY OTHER TRADES

.1 Plumbing:

.1 Supply and install drain and water services from the building services to the connection point on the equipment. Connect the equipment. Include, without being limited to the following:

.1 Water: Hot and cold water lines, shock absorbers, any required temperature and/or pressure gauges, shut-off valves, etc. Install pressure-regulating valves supplied with equipment.

.2 Drains: Drain lines, connected drains for equipment, connected drains for floor pans, floor drains with funnels for open drains on equipment, general floor drains, traps, vent piping, grease traps (as required by Code).

.3 Chrome Plating: Use chrome plated piping where exposed.

.4 Fittings: Install plumbing fittings and fixtures supplied with equipment.

.2 Electrical:

.1 Supply and install all wiring and electrical devices as specified below, or as required. Connect between building service panels and food service equipment, including, without being limited to the following:

.1 Wiring: Connect wiring to the junction boxes, circuit breaker panels or plug receptacles installed on the equipment.

.2 Disconnect Switches: Supply and install all required disconnect switches, including disconnect switches for each condensing unit. Wire from the disconnect switches to the equipment.

.3 Finishes and Floor Depressions

.1 Masonry: Supply all masonry, walls and low walls shown on the Drawings.

.2 Equipment Bases: Where specified, supply and install floor finish on all exposed steel bases or kick plates on equipment.

.3 Floor Pans: Install floor pans supplied. Grout under and around the floor pans.

.4 General

.1 Sleeves: Provide sleeves in walls, and floors for all mechanical and electrical services and for all refrigeration lines. Seal around all openings.

PART 2 Products

2.1 MATERIALS

.1 Stainless steel sheet: to ASTM A240/A240M, Type 302, 304 with ASTM A480/A480M No.4 finish, thicknesses as follows:

.1 12 Ga. (2.8 mm) for exposed frames, upright angles, reinforcements.

.2 14 Ga. (2.0 mm) for table tops, counter tops, splashback, drainboards, tray slide, reinforcements, pot sinks and all sinks over 508 mm x 508 mm, equipment bases.

.3 16 Ga. (1.6 mm) for shelves, sinks 508 mm x 508 mm or smaller, angle slides.

.4 18 Ga. (1.3 mm) for exposed bodies of cabinets, casing of exposed electrical outlets, ventilation ducts, exterior surfaces of doors and drawers.

.5 20 Ga. (1.0 mm) for interior partitions of cabinets, linings of insulated cabinets, interior surfaces of doors and drawers.

.6 Recycled content: Division 1 - LEED Requirements.

.2 Stainless steel tubing: to ASTM A269, Type TP304, commercial grade, seamless and welded with AISI No.4 finish.

.1 Recycled content: in accordance with Section Division 1 - LEED Requirements.

.3 Nickel/chromium coating: to ASTM B456, Service Condition Number SC3 bright finish.

.4 Filler strip: stainless steel, 1.3 mm thick, same finish as surrounding components.

.5 Hardwood lumber: moisture content in accordance with following standards:

.1 National Hardwood Lumber Association (NHLA).

.1 FSC Certified.

.2 National Sanitation Foundation (NSF).

.6 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 degrees C.

.1 Maximum VOC limit 250 g/L to SCAQMD Rule #1168, to GSES GS-36.

.7 Hardware and fastenings:

.1 All products to comply with the Canadian Food Inspection Agency approvals.

.2 Supply and install all required hardware to properly finish any item of equipment, and/or as specified.

.3 Catches: Magnetic standard duty with double catches for half-height doors, and heavy-duty for full-height doors.

.4 Hinges for Refrigerator Doors: Chrome-plated self-closing hinges for edgemount type. For flush doors: concealed, self-closing hinges with adjustable tension. Chrome plated finish.

.5 Latches for Refrigerator Doors: Flush type with magnetic perimeter gaskets with moulded corners for flush mount doors. Door framing to be type 430 magnetic stainless steel. All refrigerator and freezer doors to be equipped with locks.

.6 Shelf supports: Stainless steel with 20 mm wide slots. Adjustable on 13 mm centres. Stainless steel clips.

.7 Locks: flush mounted barrel type with two sets of keys. Key locks alike within departments, and differently between departments. Install locks on all reach-in refrigerators and freezers.

.8 Casters: heavy-duty, non-marking rubber wheel, permanently bonded to core. Rust resistant nickel-plated bodies. Double ball-bearing raceways. Capacity: 100 kg minimum per caster. All casters to be cart washable type, with bearing seals and grease nipples on raceways and on hollowed axles. Lubricate casters with appropriate lubrication for the environment in which they will be used.

.9 Bumpers: coordinate bumpers on all items of equipment to match. Continuous, heavy-duty strip bumper, complete with metal insert, on all purchased or custom manufactured mobile equipment. 30 mm wide x 25 mm thick.

.10 Legs and Bracing: Engineered to withstand seismic forces. Stainless steel 40 mm diameter cold rolled & welded tubing with 1.6 mm wall for legs; 30 mm diameter for bracing. Square tubes with 1.6 mm wall.

.11 Feet: Stainless steel bullet type feet with stem and compression ring to fit legs.

.12 Electrical Accessories: Equip all items of purchased or custom manufactured equipment with grounded, hospital grade fixtures. Install watertight covers in wet areas.

.13 Light Fixtures: Supply and install lighting fixtures complete with 25 mm dia. fluorescent tube with plastic safety shield, stainless steel reflector, remote ballast in a ventilated and accessible location, switch and starters; all wired to a junction box or circuit breaker panel.

.14 Plumbing Accessories:

.1 Countertop Faucets: Chrome plated brass. Commercial quality with built-in stops. Mixing faucet for hot and cold water. Crosspiece elevated above counter top to facilitate cleaning. Complete with 208 mm nozzle and wrist-action handles.

.2 Backsplash Mounted Faucets: Chrome plated brass. Commercial quality with built-in stops. Mixing faucet for hot and cold water. Complete with 208 mm nozzle and wrist-action handles.

.3 Pot Sink Faucets: Chrome plated brass. Commercial quality with built-in stops. Mixing faucet for hot and cold water. Complete with 305 mm nozzle and wrist-action handles.

.4 Wall Mounted Faucets: Chrome plated brass. Commercial quality with built-in stops and vacuum breaker. Mixing faucet for hot and cold water. Complete with threaded nozzle and pail hook. Support brace fixed to wall.

.5 Sanitizing Stations: Chrome plated brass. Commercial quality with built-in stops. Single hot water only. Threaded short nozzle for connection to hose.

.6 Retractable Hose Reels: Retractable reel with stainless steel cover and 15 meter long hose. Complete with squeeze type spray valve with knife-action spray pattern. Chrome plated mixing valve for wall mounted installations, or concealed type for counter mounted installations. Chrome plated shut-off valve and vacuum breaker. Two brass`check valves.

.7 Drains: Chrome plated brass fixtures, 40 mm or 50 mm diameter. Corner type drains with removable stainless steel standpipe overflow. Removable stainless steel perforated corner guard.

2.2 COMPONENTS

.1 Laminated wood tops: max 50 mm wide, clear edge grain strips, laminated with waterproof glue to CSA O112-Series into 50 mm thick slabs, sanded smooth and sealed. Sanded and finished with paraffin wax on both sides. Splashback as specified; wood or stainless steel. Thickness: 45 mm thick for tables 915 mm wide and under, 70 mm thick for tables over 915 mm wide. Mount on stainless steel full-length channel frame

.1 Core material:

.1 FSC Certified.

.2 Urea-formaldehyde free.

2.3 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, table tops, drain boards, tray rails, shelving.

.1 One continuous piece if 3.0 m or less in length.

.2 If over 3.0 m, sections to be welded and polish 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: 38 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.

2.4 SINKS

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

.2 Corners:

.1 Horizontal and vertical minimum radius 38 mm on both planes, with coved corners.

.2 Corners of tops: outside radius minimum 38 mm.

.3 Construction: fully welded.

.4 Compartment bottom: slope down towards drain.

.5 Corner type drain: 38 mm complete with tail piece, 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.

.6 Centre drain: stainless steel crumb cup waste with stainless steel strainer basket or lever action type where indicated, 40 mm unless indicated otherwise.

.7 Where multiple compartments are indicated, space between compartments 25 mm.

.1 Weld compartments into counter top or drain boards.

.8 Drill holes for hot and cold water faucets.

.9 Drain boards: 2 mm thick stainless steel, integral with, and sloping down 2% towards compartments.

.10 Edges: up and rolled or as indicated.

.11 Top of sink edge and drain board: straight horizontal line.

.12 Backsplash: 2 mm thick stainless steel, rolled up and splayed, integral with sink, drain board or top.

.1 Where countertop or drain board meets backsplash or upturn, cove 19 mm unless otherwise indicated.

.2 Horizontal and vertical junctions:

.1 Fill in and weld ends of backsplash.

.2 Fill backsplashes at exposed locations to 38 mm below tops.

.13 Legs and bracing: as specified.

.14 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.

.15 Solid undershelf: as specified.

2.5 UTILITY AND WORKTABLES

.1 Tops, reinforcing and leg channels: 2 mm thick stainless steel, with top edges formed as indicated.

.1 Reinforcing and leg channels where required: do not protrude below bottom edge of table top.

.2 Tops: sound deadened using laminated stainless steel/heavy duty sound insulation construction, reinforced to prevent sagging. Single-sheet construction without joints. Where length of top exceeds sheet size, joint to be fully welded and invisible. Corners to be fully welded and polished.

.3 Marine edge on all tables with sinks.

.2 Legs and bracing: as specified.

.3 Solid undershelf: as specified. Shelves over 450 mm wide in two (2) sections front-to-back.

.4 Backsplash on counters and tables located against walls, except mobile tables. backsplash on backs and ends where against walls. Intersection of counter top and backsplash on 13 mm radius, with corners coved on 19 mm radius to create spherical sections at intersections. Top of backsplash turned back toward wall 50 mm on 45^{o} angle, then turned down 13 mm at rear. Enclose all exposed ends and backs of exposed backsplashes. Turn-up and seal tops to adjacent equipment where no backsplash is required.

.5 Marine edges raised 10 mm at 30 degrees, then turned down 40 mm, with a return of 13 mm. Boxed edges turned down 40 mm, with a return of 13 mm. Rolled edges on sinks and dishtables with all corners coved on 19 mm radius to create spherical sections at intersections. All working surfaces to slope towards sinks, or back to dishwashing machines.

.6 Sink basins: All stainless steel construction with #4 finish. Corners rounded on a 38 mm radius to form spherical coves. Slope bottom of basin towards drain. All joints welded and polished to be invisible. Sinks for wood tops with integral stainless steel flange with extended back to mount faucet. Flange recessed into wood top and sealed. Sinks for wood, laminated plastic or Solid surfacing material tops with marine type flange and watertight gasket.

.7 Cabinet Bodies: All single sheet stainless steel construction, with any required joints fully welded and invisible. Vertical mullions flush with and welded to front of cabinet body and bottom shelf, enclosed at back with stainless steel channel.

2.6 DRAWERS

.1 Body material: 1 mm thick stainless steel.

.2 Front material: 2 mm thick stainless steel with stainless steel channel longitudinal brace where lock goes through. Double pan front with mineral insulation. Full-length recessed handles with locks. Corners fully welded.

.3 Corners: welded.

.4 Drawer pan 510 mm x 510 mm x 125 mm deep, removable without removing frame.

.5 Sides: heavy-duty full extension.

.6 Hardware:

.1 Tracks with neoprene or nylon rollers and stainless steel ball bearings in stainless steel channels with easily released stops.

.2 Rubber stoppers to prevent drawers from sliding out except by intent.

.1 Adjust for free running action.

.7 Housing: 1 mm thick stainless steel.

.1 Drawers in open equipment: housed.

2.7 CABINETS AND COUNTERS

.1 Support individual cabinet sections with at least four (4) adjustable stainless steel leveling legs and casters (2 with brakes)or feet, not over 1800 mm apart longitudinally, not over 760 mm from front to back.

.1 Actual spacing as indicated.

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

.1 Edges as indicated.

.3 Body: 1 mm thick stainless steel.

.4 Pilasters: 2 mm thick stainless steel.

.5 Angle slides: 1.6 mm thick stainless steel angles, minimum 50 x 50 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 with full-length recessed handle, 1 mm metal core thickness, rigid mineral insulation core. Corners fully-welded.

.1 Maximum length: 610 mm.

.2 Finish: AISI 2B for inside pan.

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

.8 Handles: stainless steel recessed.

2.8 DISH TABLING

.1 Tops, for manual operation free-standing design: 2 mm thick stainless steel. Edges as indicated.

.2 Legs and bracing: as specified. Legs not over 2400 mm apart longitudinally.

.1 Reinforcing for wide tabling: 2.8 mm stainless steel “top-hat” channels welded to underside of top.

2.9 REFRIGERATED CABINETS

.1 Construction: All stainless steel interior and exterior. Interior corners fully coved and welded. 50 mm urethane insulation. Width of door openings to receive trays; obtain sample tray from the PWGSC representative. Removable magnetic plastic breaker strip around door opening, complete with heat tape around perimeter of doorframe. Fully insulated doors with locks. Interior light fixtures with shielded light bulbs and door-actuated switches. Flush-mounted dial

thermometer on exterior face of cabinet body. Removable stainless steel wire shelves, reinforced to prevent sagging.

.2 Refrigeration systems: Self-contained condensing units: semi-hermetic type, consisting of base, compressor assembly, air or water-cooled condenser as indicated; air-cooled units with fan to provide ventilation. Mounted on pullout slides to facilitate servicing. Complete with contactor and motor starter, suction and discharge valves, oil separator, high and low pressure controls, cord, plug and receptacle, and electrical protection devices. All compressors designed to operate with non-ozone depleting refrigerant.

.3 Blower coils: Blower coil with drain line extended to funnel drain. Insulate all refrigerant lines with Armaflex. Switch with pilot light mounted on front of cabinet to shut off condensing unit. Each cabinet with an individual thermostat and solenoid valve for temperature adjustment.

.4 Defrost: Equip refrigerators, freezers, cold pans, and refrigerated display cases with automatic defrost. Electric defrost elements on all freezers, with drainline heaters. Run drainlines to electric vaporizer pans or funnel drains as indicated. Supply and install time clocks for air defrost for refrigerators and cold pans.

.5 Ventilated access panel: Hinged, louvered stainless steel access panel on front and end of condensing unit housing. Reinforced to prevent twisting. Enclose self-contained condensing units on all sides. Provide adequate ventilation panels to cool air-cooled condensing units.

.6 Valve: When condensing unit is remote, install a switch and solenoid valve at cold pan location to stop flow of refrigerant to the coil.

2.10 ITEMIZED EQUIPMENT

.1 Refer to the above clauses of General Specifications that form part of the requirements for each standard made or custom made item of equipment

.2 Refer to Drawings and to the Detail Drawings included in this Section of Specifications for specific details of construction for custom fabricated equipment

.3 Refer to all of the following clauses for specific details related to both standard made and custom-made items of equipment

.4 Supply and install the following equipment:

#	Qty	Description
21	11	Stainless steel work table
Dimensions:		1220 mm x 610 mm x 915 mm high.
Construction:		Refer to Part 2 of Specifications Section 11 40 20 and Drawings. One piece 14 ga. stainless steel top with boxed edges on all sides. Top reinforced with 14 ga. cross members. Stainless steel legs, 41 mm dia., with 150 mm dia. casters with brakes, swivel locks, and donut bumpers. Open under, with stainless steel undershelf fully welded to legs. Supply and install one drawer unit with stainless steel housing at right. Drawer front double pan construction with 18 ga. mm stainless steel front panel and 20 ga. interior. Full-length recessed handle with integral lock. Drawer frame 16 ga. stainless steel to hold drawer pan. Stainless steel housing, 18 ga. mm thick, to enclose drawer.
Services:		Utility electric outlet on wall By Electrical Division.

#	Qty	Description
29	1	Stainless steel double pot sink w/drainboard & faucet
Dimensions:		2438 mm x 760 mm x 915 mm high.
Construction:		Refer to Part 2 of Specifications Section 11 40 20 and Drawings. All stainless steel. Top, 14 ga. thick, with rolled rim on three sides and with 10” high splashback, 50 mm thick, on rear. Splashback enclosed on ends and back. Rolled edged turned up on 15 mm radius to a height of 50 mm, rolled 180 degrees on 38 mm radius. Rolled edges fully coved at intersections, using cove corner inserts and triangular inserts Two (2) faucets with wrist handles mounted on splashback. Sink basins 24” x 24” x 14” mm deep, in 14 ga. stainless steel with all corners coved on 1 13 mm radius. Bottoms sloped to drains. Corner drains with removable standpipe and removable, perforated corner guard. Mounted on four (4) 38 mmstainless steel legs with stainless steel feet. Crossbracing at ends and rear. 14 ga. leg saddles welded to underside of sink basins. Weld a strip of 14 ga. stainless steel to the underside of the basins, bridging between the basins to strengthen the structure.
Services:		13 mm hot & cold water. 2 x 38 mm drain, connect to grease trap. Utility electric outlet on wall By Electrical Division.

#	Qty	Description
30	1	Stainless steel work table
Dimensions:		1524 mm x 760 mm x 915 mm high.
Construction:		Refer to Part 2 of Specifications Section 11 40 20 and Drawings. One piece 14 ga. stainless steel top with boxed edges on all sides. Top reinforced with 14 ga. cross

members. Stainless steel legs, 41 mm dia., with 150 mm dia. casters with brakes, swivel locks, and donut bumpers. Open under, with stainless steel undershelf fully welded to legs.

Supply and install one drawer unit with stainless steel housing at right. Drawer front double pan construction with 18 ga. mm stainless steel front panel and 20 ga. interior. Full-length recessed handle with integral lock. Drawer frame 16 ga. stainless steel to hold drawer pan. Stainless steel housing, 18 ga. mm thick, to enclose drawer.

Services: Utility electric outlet on wall By Electrical Division.

#	Qty	Description
35	2	Stainless steel work table

Dimensions: 850 mm x 760 mm x 915 mm mm high.

Construction: Refer to Part 2 of Specifications Section 11 40 20 and Drawings. One piece 14 ga. stainless steel top with boxed edges on all sides. Top reinforced with 14 ga. cross members. Stainless steel legs, 41 mm dia., with 150 mm dia. casters with brakes, swivel locks, and donut bumpers. Open under, with stainless steel undershelf fully welded to legs.

Supply and install one drawer unit with stainless steel housing at right. Drawer front double pan construction with 18 ga. mm stainless steel front panel and 20 ga. interior. Full-length recessed handle with integral lock. Drawer frame 16 ga. stainless steel to hold drawer pan. Stainless steel housing, 18 ga. mm thick, to enclose drawer.

Services: No Services.

#	Qty	Description
68	1	Soiled dishtable w/pre-rinse sink and pre-wash faucet, waste chute

Dimensions: “L”-shaped. 2980 mm x 900 mm, and 1875 mm x 760 mm. 864 mm high at dishwasher.

Construction: Refer to Part 2 of Specifications and Drawings. All stainless steel. Top reinforced and with rolled rim and with 255 mm high splashback against walls. Left end turned-down into dishwasher and sealed. Rolled edged turned up on 19 mm radius to a height of 50 mm; rolled 180 degrees on 38 mm radius.

Rolled edges fully coved at intersections, using cove corner inserts equivalent to Component Hardware #J70-4701 and triangular inserts. Mounted on 38 mm stainless steel legs with stainless steel feet at right end only. Supported on dishwasher at right end. Open underneath with crossbracing at rear. Coordinate construction with manufacturer of dishwasher. Slope towards dishwasher.

Space for garbage can under where shown on drawings. Cut a hole in the top of the table and supply and install a rubber waste chute.

Pre-Wash Sink: Integral sink with removable basket rails fixed to removable strainer baskets. Sink 250 mmx 250 mmx 10” deep, all welded stainless steel construction with coved corners and centre drain equivalent to Component Hardware model #D23-4161. Basket rails

constructed of 2 mm x 50 mm stainless steel flat bar on edge for maximum strength, mounted in holding clips.

Pre-rinse Faucet: Wall-mounted faucet with jointed extended arms and spray head with knife-edge water jet nozzle.

Features:
Complete pre-rinse assembly with wall mounted mixing faucet.
203 mm centres.
13 mm female inlets.
Built-in spring check valves.
Water conserving self-closing spray valve with knife-edge jet.
Roto-flex swivel joint.
Wall bracket, to support vertical arm.
Add-a-faucet nozzle with shut-off valve to use to fill sink basin.
Fittings and fixtures constructed in brass and chrome-plated.

Services:
13 mm hot & cold water.
38 mm drain, connect to grease trap.
10 Amp – 120 v – 1 phase electric outlet on wall By Electrical Division.

#	Qty	Description
68A	1	Basket Shelf mounted on soiled dishtable

Dimensions: 2134 mm long. To hold four (4) dishbaskets.

Construction: Refer to Part 2 of Specifications and Drawings. All stainless steel. Stainless steel tubular construction with three tubes forming shelf. Tubular front rail and ends to prevent baskets from falling off. Shelf to hold baskets on 45 degree angle. Fixed to wall with stainless steel brackets fitted to adjustable-height mullions. Reinforce wall as required.

Services: No services.

#	Qty	Description
77	1	Stainless steel work table c/w sink 508 x 508 and faucet

Dimensions: 9150 mm x 760 mm x 3150 mm high.

Construction: Refer to Part 2 of Specifications Section 11 40 20 and Drawings. All stainless steel. Top with marine edge and 150 mm high splashback at rear and right end. Backsplash enclosed on rear and two ends. Sink 510 mm x 510 mm x 255 mm deep with corner waste with removable standpipe and perforated removable stainless steel guard. Faucet with wrist handles. Stainless steel cabinet under sink, enclosed on three sides and with door on front. Open under to left of sink with stainless steel undershelf fully welded to legs. Four (4) stainless steel legs with adjustable feet.

Supply and install two (2) drawer units with stainless steel housing at right. Drawer front double pan construction with 18 ga. mm stainless steel front panel and 20 ga. interior. Full-length recessed handle with integral lock. Drawer frame 16 ga. stainless steel to hold drawer pan. Stainless steel housing, 18 ga. mm thick, to enclose drawer.

Services: 2 x utility electric outlets on wall By Electrical Division.
13 mm hot & cold water.
38 mm drain.

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 Supervision: Provide a competent site supervisor with a minimum of five (5) years of experience in food service equipment installation.

.3 Level base cabinets by adjusting leveling legs.

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

.5 Secure equipment to floor and wall as indicated.

.6 Securely fasten wall cabinets as indicated.

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

.8 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.

.9 Field weld counter tops, table tops, and drain boards joints over 3 m long.

.10 All equipment is to be installed to withstand seismic forces.

3.3 FIELD QUALITY CONTROL

.1 Inspection: PWGSC Representative may conduct shop inspections of equipment fabrication prior to delivery to site where deemed to be necessary.

.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 CLEANING AND ADJUSTING

.1 After installation, clean, fit and adjust operating hardware.

3.5 DEMONSTRATION AND TRAINING

.1 Arrange for installer to demonstrate to the PWGSC representative's personnel in operation and maintenance of equipment in accordance with Division 1 - Demonstration and Training.

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

.3 Compile all manuals, warrantees and parts lists into binders and turn over to the Owner.

3.6 COMMISSIONING

.1 Refer to Sections 01 91 00, 01 91 01 and 01 91 41 for Commissioning Requirements.

.2 Provide full commissioning services for all items of equipment provided by the Owner as well as items supplied under Division 11.

.3 Submit a schedule of demonstration by equipment suppliers four (4) weeks prior to Substantial Completion of the Work. List the exact time for each equipment demonstration. Demonstrations to include instruction and training on the proper use and maintenance of equipment. Once the approved schedule is returned, make all necessary arrangements for the demonstration sessions.

.4 Provide required operating and maintenance instructions as specified in Division 1

.5 Submit three (3) bound manuals of operating instructions, maintenance instructions, and spare parts list for each item of equipment. Use numbered tabs to separate numbered/indexed items in the manual. Identify the service company for each item in an appendix to the manuals. Submit manuals at least two (2) weeks prior to the equipment demonstrations during the commissioning phase. Submit copies of As-Built Drawings and Reviewed Shop Drawings.

.6 Provide Start-up Forms and Static Verification Forms and Functional Test Forms as required by Division 1 Specifications. Submit sample forms for approval four weeks prior to the end of installation.

.1 **Sample Static Verification Form:** This form collects the nameplate information of each piece of equipment and verifies that what was specified is what was actually installed.

.2 **Sample Static Verification Form: Sample Start - Up Form:** This form is typically provided by the manufacturer and is essentially a check list of what needs to be verified before a piece of equipment is started for the first time.

.3 **Functional Test Form:** This form itemize the various tests that are required to ensure that the equipment is working properly. The manufacturer may also have one available to use..

END OF SECTION

PART 1 General

1.1 SECTION INCLUDES

.1 Materials and installation, administrative and procedural requirements for prefabricated walk-in freezers and coolers and refrigeration systems.

1.2 PRODUCTS SUPPLIED BUT NOT INSTALLED UNDER THIS SECTION

.1 Electrical disconnect boxes and electrical breaker panels.

1.3 PRODUCTS SPECIFIED AND SUPPLIED BY OTHER TRADES

.1 Fire suppression systems (dry sprinklers) inside walk-in coolers and freezers.

1.4 REFERENCES

.1 American National Standards Institute/American Society of Mechanical PWGSC Representative (ANSI/ASME)

.1 ANSI/ASME B16.26-2001, Cast Copper Alloy Fittings for Flared Copper Tubes.

.2 ANSI/ASME B16.29-2001, 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 255-2000, Standard Method of Test of Surface Burning Characteristics of Building Materials.

.3 American Society for Testing and Materials International, (ASTM)

.1 ASTM A167-99, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM A240/A240M-02, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.3 ASTM A480/A480M-02, 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 A653/A653M-02a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM B88M-99, Standard Specification for Seamless Copper Water Tube [Metric].

.6 ASTM B280-02, Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.

.7 ASTM E84-01, Standard Test Method for Surface Burning Characteristics of Building Materials.

.8 ASTM E162-02a, 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 Canadian Standards Association (CSA International)

.1 CSA C22.2 No.137-M1981(R1999), Electric Luminaires for Use in Hazardous Locations.

.6 Underwriters' Laboratories of Canada

.1 CAN/ULC-S704-2001, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

.2 CAN/ULC-S705.1-2001, Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.

1.5 WORK INCLUDED

.1 Supply all labour, materials, transportation, installation and cleaning of the prefabricated walk-in cold rooms.

.2 Supply and install fully functional refrigeration systems to operate at the specified temperatures, using refrigerants, which are not ozone, depleting.

.3 Provide access and service panels as necessary for the proper inspection and maintenance of equipment.

.4 Supply and install condensate drain lines with traps from blower coils to funnel floor drains. Run drain lines inside the cold rooms and exit at the funnel drains. Supply and install drain line heaters with thermostats for cold rooms with operating temperatures below 0°C. Paint evaporator drains to match interior of cold room. Provide required access to all drains and drain lines.

.5 Time Clocks: Supply and install time clocks behind a removable panel above the door of each cold room. Wire from condensing units to blower coils and time clocks.

.6 Panic and Temperature Alarms: Supply and install panic and temperature alarms with relays for interconnection to the remote alarm panel.

1.6 SUBMITTALS

.1 Submit shop drawings in accordance with Division 1 - Submittal Procedures.

.2 Indicate:

.1 Construction details of equipment by drawings and manufacturers' literature.

.2 Roughing-in requirements for mechanical and electrical services.

.3 Installation details.

.3 Provide operation and maintenance data for incorporation into manual specified in Division 1 - Closeout Submittals.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Division 1 - Construction/Demolition Waste Management And Disposal.

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Separate for reuse and recycling and place in designated containers “Steel, Metal and Plastic” waste in accordance with Waste Management Plan.

.5 Place materials defined as hazardous or toxic in designated containers.

.6 Unused caulking material must be disposed of at an official hazardous material collections site as approved by PWGSC Representative.

.7 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.8 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 Products

2.1 MATERIALS

.1 All products to comply with the Canadian Food Inspection Agency approvals.

.2 Stainless steel sheet: to ASTM A167, A240/A240M, type 302 and 304 with No. 4 finish.

.3 Galvanized steel sheet: commercial grade to ASTM A653/A653M, with zinc coating (galvanized) to ASTM A653/A653M.

.4 Mild steel sheet: cold rolled to Society of Automotive Engineers (SAE) 1010 to 1020 suitably prepared for specified finish.

.5 Aluminum sheet: utility sheet with "stucco" pattern finish on exterior panels and smooth finish on interior panels.

.6 Galvalume: steel sheet with aluminum zinc alloy coating with baked on polyester finish.

.7 Sealant: to CAN/CGSB-19.13, colour to match panel.

.8 Isolating coating: to manufacturer's recommendations.

.9 Insulation for panels and screeds: to CAN/ULC-S705.1, Class 3, poured type foamed-in-place polyurethane (urethane), 100 mm thick. NSF, UL, C-UL, CSA, ULC panel HACCP compliant.

.10 Insulation for built-in insulated floors: to match wall panels.

2.2 FABRICATION

.1 Overall dimensions: as specified for each item. Ensure maximum storage space is provided. Prefabricated modular design and construction. Panel sections: precision die formed metal pans accurately spaced and insulated. Panel edges and corners to have tongue and grooves, formed-in-place, to assure airtight, vapour proof joints using gaskets or sealants. Designed in the year 2012 or later. Constructed with modular panels possessing cam-lock closers, for secure and tight fit between joints. All panels shall be interchangeable and have a non-silicone, rubber gasket seal to ensure air tight and waterproof seals at the joints without the use of applied silicone. Ensure panels are a minimum 102mm thick material core, made from CFC free and HCFC free, material and permanently affixed to the interior and exterior metal panels. Have a minimum R-value of R27 for the cooler and R-32 for the freezer and retaining 75% of its R-value after 5 years.

.2 Wall, ceiling and floor panels: widths to the nearest 25 mm.

.3 Corner panels: 300 x 300 mm wide externally.

.4 Door panels: insulated and finished as per exterior and interior panels with 865 x 1980 mm clear door opening, reinforced to prevent door panels from twisting, racking or warping. Ensure that doors will close and seal opening. Equip each door panel with:

.1 In fitting flush mounted type door (swing as indicated) to fit door opening, insulated and finished same as panels, having 1220 high x 1.6 mm thick stainless steel push/kick-plates on both exterior and interior and having soft thermoplastic gasket with magnetic steel core at top and both sides, adjustable rubber wiper gasket at bottom. Gaskets to be oil, fat, water and sunlight resistant and be replaceable. Each refrigerator door with a 500 mm x 500 mm thermopane window. Freezer windows to be heated.

.2 Door panels with perimeter heat cables with fuse and thermostat. Bottom of door shall seal with an adjustable double sweep gasket. Door gasket to be water, fat and oil resistant and be replaceable. Threshold (sill) plate shall be made of materials that will withstand heavy traffic. Door jamb shall be rigid frame designed for easy cleaning and maintenance. Removable doorjambs and sill plates for access to heat cables. LED light fixtures with LEDs. Pre-wire switch to light fixture, and wire multiple light fixtures together. Use three (3) way switches if more than one door. Supply and install light fixtures where corners create shadows

.3 A combination door handle and locking device shall be provided with features of no exterior hardware that can be removed from the outside of the door. The lock shall be field selectable to allow for keyless entry or automatically lock each time the door is closed. The locks are to be designed so that they may be re-keyed in the field using a CSC supplied 7 pin **BEST Lock core** / key way. The lock shall have an interior assembly as to allow safe egress at any time.

.4 Hinges, spring loaded, self-closing type, with stainless steel pin and nylon cam-type bearing, of satin or bright polished finished aluminum.Kason slamlock latch for opening door by breaking force of trigger-action door closer and magnetic gasket. Lockable device with have inside safety release handle capable of opening door from within regardless of whether door is locked or not.

.5 One foot treadle to match hinges and latch, for opening door without use of hands.

.6 One trigger-action positive door closer, located on interior, to assist in positive closing of door.

.7 Built-in thermostatically controlled heater cables inside perimeter of door and beneath sill plate and jambs of door opening. Heaters to have fused protection within panels.

.8 Sliding doors to be 100 mm thick insulated panels as specified for wall panels, and with gasket. Stainless steel kickplates, 1.6 mm thick and 1220 mm high on both sides of door. Manual operation with stainless steel frame, rubber wiper, floor guide, heavy-duty door pull. Padlock provision. Safety release mechanism. Clear PVC strip curtain mounted in doorway - standard of acceptance: Raburn, with pebbled finish and Velcro attachment.

.9 Threshold plates: 2.0 mm stainless steel and removable.

.10 One combination light switch and 50 mm diameter flush-face dial-type thermometer to provide temperature readings from -51°C to 27°C and mounted on hinge side of panel approximately 1525 mm from floor. Cover sensing bulb with protective stainless steel moulding.

.11 Sliding doors shall be horizontal and manually operated door with guide system, heavy duty track assembly and hardware, lock & inside release. Minimum 36” high, exterior ⅛” aluminum diamond tread, door and frame mounted kick plates to prevent damage. Construction and finish shall be the same as panels. Complete seal between door, threshold, and door jamb. Threshold (sill) plate shall be made of materials that will withstand heavy traffic. Door jamb shall be rigid frame designed for easy cleaning and maintenance. Built-in thermostatically controlled heater cables inside perimeter of door and beneath sill plate and jambs of door opening. Heater wire shall be provided in an electrically safe housing and be easily replaceable without the need for clips or special

tools. All conduits for the inner-wiring of the door panel shall be totally concealed in the panel. Door section is to be provided with a combination light switch and thermometer (reading the interior temperature in Centigrade).

.12 LED light fixtures, 1220 mm long and one round LED light fixture at each door, with guard, mounted not less than 1980 mm from floor on interior of panel, operated from toggle switch with pilot light, mounted 1372 mm from floor on exterior of panel, adjacent to latch. All light fixtures to be designed and constructed for cold and wet applications. All factory pre-wired and terminating in vapour-tight junction box that light is mounted on. Number of fixtures as required to produce light to all areas within cold room. Designed light levels within the refrigerators and freezers shall be minimum 150l x measured at 760mm A.F.F. and shall account for shelving, appropriate wall, floor and ceiling reflectance and light loss factors based on source type, dirt depreciation and ambient temperature correction.

.5 Ceiling panels: reinforced internally or externally as required, to support evaporator. Where external reinforcement is needed and through fasteners are used, fasteners to be of low heat conducting material such as teflon. Insert fasteners in teflon sleeves to prevent compressing of insulation.

.6 Screeds: same construction materials and finish as wall panels. Length and configuration to match wall and corner panels. Reinforce screeds internally at 584 mm centres to accommodate fastening to building and/or wearing floor. Reinforcing and floor fastenings to form an integral part of panel locking devices system.

.7 Interior floor panels: 1.2 mm minimum, core galvanized steel. Floor panels to withstand 5000 PSI evenly distributed load. Made of materials that are resistant to mould and water to ensure a strong structure that will not rot or rust. Floor finishes to have aggressive surface to reduce slips.

.8 Panel thickness and finish for exterior and interior panels exposed to normal view except floor panels: factory painted, colour white.

.9 Locking devices: panel sections to have cam- action locking devices, spaced at maximum 950 mm vertically, 600 mm horizontally. Male and female lock pockets. LP continuous panels to slide into adjacent panels by means of grooves built into panel profile.

.10 LED lights: to CSA 22.2 No.137 Class III Hazardous Locations.

.1 Lamps, 1220 mm long, minus 18^{o}C HPF ballast.

.2 Satin anodized aluminum housing.

.3 Completely gasketted enclosure.

.4 High impact opal acrylic lenses.

.5 Pressure locking devices.

.6 White baked-on acrylic finishes.

.11 Removable closure panels: extend from lower edge of erected prefabricated ceiling panels to finished building ceiling. Exterior cold rooms (#5, 5A & 8) with panels extending to underside of sloped roof. Extend cover strips or angles from building floor to ceiling closure panels between exposed ends of walk-in boxes and building wall. Closure panels, cover strips or angles to match exposed exterior wall panels.

.12 Bumper rail: 70 x 200 x 1.6 mm stainless steel on exposed exterior panels, mounted 300 mm from center of rail to finished building floor. Where rub rail is at external corner, mitre joint and weld. Box open ends. Top and vertical ends where rail makes contact with wall panels are to be sealed. Two rub rails are required on interior of garbage refrigerator mounted 600 and 300 mm from respective centers to refrigerator floor. Rub rails are not required at doors, door panels or within 200 mm of internal angles of walls.

.13 Corner Guards: Supply and install 150 mm x 150 mm x 1830 mm high, 12 Ga. (2.0 mm thick) stainless steel corner guards, on all exposed exterior and interior corners.

.14 Two-way heated pressure relief port: in freezer wall panel away from direct air stream flowing from coil. Embed anti-sweat heater cables in frame of port so intake and exhaust ports will not freeze. Terminate wiring in junction box on interior panel over top of port.

.15 Temperature alarm system: self-contained with visual and audible alarm. Include following:

.1 Power source failure alarm with adjustable set point for temperature.

.2 Jack for remote alarm telephone dialer and enunciator panel.

.3 Digital thermometer with minus 15°C to plus 30°C range.

.4 Built-in battery and charger.

.16 Cold rooms exposed to the exterior to have flashings as detailed by the Architect to shed water away from the building structure. Material to match cold roon exterior panels.

.17 Supply and install one painted ceiling support system to secure the cold room ceiling panels in place. Refer to Sections 2.4 and 2.5 in Section 05 12 23 for paint requirements. Bolt the suspension system to the underside of the building structure – coordinate installation with the General Contractor. Design the system to withstand the load. There must be a suspension rod at every intersection of 4 ceiling panels so it holds the four corners. If a single ceiling panel is more than 3.8 metres in span, it must also be supported as an intermediary span. Supply and install all hanging rods as recommended by the manufacturer to suspend the cold room ceiling panels from this suspension system. **NOTE: this suspension system is supplied and installed by SECTION 11 41 10**.

2.3 REFRIGERATION EQUIPMENT - REMOTE INSTALLATION

.1 Refrigeration equipment: with refrigerant HFC or HCFC, fully automatic in operation, and to conform to following minimum requirements. Each refrigeration system shall have the MINIMUM acceptable requirements and all mechanicals are tobe confirmed for proper sizing to meet the needs of the walk-in room dimensions and performance specifications

.1 Condensing units: complete with motor, water-cooled condenser connected to recirculating heat-recovery system, safety screen, receiver, hermetic or accessible hermetic type compressor, and other necessary components mounted in flexible manner on common base. Design unit for 16 h to 18 h operation at specified evaporating temperature, in 32.2°C ambient temperature. Each unit shall be Multi-Circuited Refrigeration Parallel configuration Rack System, air cooled, completed with electrical and refrigeration connections including necessary components factoryinstalled on both evaporator and condensing unit assemblies, prewired, ready for siteconnections

.2 Remote condenser and air-cooled condensing unit bases and electrical boxes constructed of heavy-gauge galvanized steel (G90) with plated or stainless steel hardware for corrosion-free assembly. Rooftop condensing units with stainless steel louvred enclosures, complete with adjustable height mounting legs toaccommodate sloped roof..

.3 Compressors and controls wired using water and oil resistant wire, Type TEW 105°C and protected by plastic or metallic conduit secured with certified connectors.

.4 Electrical Boxes to be located on the front of the unit for easy access and service. Manufactured of heavy-gauge galvanized steel and assembled with plated or stainless steel hardware for corrosion protection.

.5 Control Panels to be complete with terminal blocks, control transformer, control circuit fuses, compressor contactors, fan interlock, fix high and adjustable low pressure control, oil failure switch (for compressors with positive pressure oil pump), and a pump-down

switch. The wires are to be numbered and color-coded, conveniently routed in wiring ducts. All terminal blocks are to be identified to match the wiring diagram.

.6 Compressors air or suction cooled, refrigeration duty, accessible semi-hermetic. Supplied with suction and discharge valves, suction strainer, oil filter, oil pump on model 3HP and larger, solid state or line break thermal protection, crankcase heater, mineral oil for HCFC refrigerant and Polyol Ester oil with HFC refrigerant. Receivers 150 mm dia. and smaller to be UL/CSA certified and supplied with a fusible plug. Receivers 168 mm dia. and larger to be CRN or ASME “U” stamped. Supplied with relief valves. All receivers with inlet and outlet back-seated Rotalock valves.

.7 Factory installed Refrigeration Flooding Valves on each unit.

.8 Evaporator: forced-convection, unit-cooler type, suspended from ceiling panels, with forced-air discharged parallel to ceiling. Assemble air circulating motor, multifin and tube type coil and grille within protective housing also, contain expansion valve, with strainer, heat exchanger and inlet and outlet connections within same housing complete with safety screen. Air circulation motors: lifetime sealed. Entire unit-cooler assembly readily accessible for cleaning. Provide drip pan and drain connection. Equip unit coolers with mounting brackets for installation and controls for safe and satisfactory operation. When Walk-In is used for freezer applications, provide an automatic system for defrosting unit cooler, including heaters and time control. Provide disconnect switch within 600 mm of evaporator motor. Low-velocity coils where stored product may be exposed to the air inside the cold room – such as, fruit and vegetable cooler, meat cooler, dairy cooler

.2 Refrigerant tubing:

.1 Conform to ASTM B88M and ASTM B280 requirements.

.2 Refrigeration Copper Tubes ASTM certified and factory bent using a programmable CNC tube bender. Manufactured with the minimum number of fittings and brazed joints to reduce the risk of leaks.

.3 Relief valve discharge pipe on outdoor installations shall be copper tube type "L" with brazed joints.

.4 Fittings:

.1 Conform to ANSI/ASME B16.26 and ANSI/ASME B16.29.

.2 Long radius type for elbows and return bends.

.3 Factory Testing:

.1 All units are to be electrically tested. A Dielectric Voltage Withstand Strength Test to be performed on all units. The compressors are to be energized, and the operating sequence and all controls on each unit are to be factory tested. Refrigeration piping is to be leak tested and the system is to be pressurized and sealed with -40°F/-40°C dew point nitrogen.

.2 Refrigeration split systems greater than 3 tons of cooling require a TSSA certifcate authorization number.

2.4 DRAIN LINES AND HEATER CABLES

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

.2 Ensure equipment is manufactured and installed by company having personnel skilled in manufacturing and installing of prefab walk-in freezers and coolers and having continuous proven experience within last five years.

.3 The PWGSC Representative and / or the Food Service Consultant will conduct shop inspection of equipment fabrication prior to delivery to site in accordance with Division 1 - Quality Control.

2.5 ITEMIZED EQUIPMENT

.1 Supply and install the following items:

REFRIGERATED STORAGE

#	Qty	Description
5	1	Walk-in Cooler – Receiving Cooler (139)

Dimensions: 5100 mm x 4100 mm x 2750 mm high.

Construction: Refer to Part II of these Specifications, & Detail #CR-5. Include exterior flashing.

Floor: Insulated floor within floor depression such that the interior cold room floor is flush with the kitchen floor. Vented under floor by General Contractor.

Vent Inlets/Outlets: Supply and install stainless steel vent inlets and outlets for underfloor vent system as shown on Detail #CV-1.

Temperature: 5° - 6° C.

Doors: One (1) sliding door 1220 mm x 1980 mm high.

Low Profile Evaporator:

Capacity:	16,800 BTU/H
Fan Arrangement:	2 x 1
Refrigerant:	R404A
Refrigerant Charge:	2 lbs
Liquid Temp:	38 degrees C.
Liquid Line Conn.:	13 mm
Suction Line Conn.:	22 mm
Voltage:	208 – 1 phase
Fan Motor HP:	0.05 HP
Fan Motor RPM:	1550

Condensing Unit:

Capacity:	16,300 BTU/H
HP:	2
Liquid Line Conn.:	9.5 mm
Suction Line Conn.:	22 mm
Saturated Suction T:	25 degrees F.
Voltage:	208 – 3 phase
Compressor RLA:	6.8
Compressor LRA:	50
Unit Amps:	7.9
Unit MOP:	15 A

Factory Installed Accessories:
Semi-Hermetic compressors.
Receiver with isolating valves.
Liquid sight glass, filter drier.
Solenoid Valve (not installed ship loose)
Replaceable Suction Filter
Suction Accumulator
Electrical control panel including non-fused disconnect switch, air and/or electric defrost timer.

All electrical wires running in conduits.
Compressor discharge thermostat.
High / low pressure control convertible automatic to manual.
Adjustable pressure switches with flexible hoses.
Over Sized and cleanable air cooled Condenser.
Oversized Receiver.
TX Valve.

Services:

Condensing Unit:	2 HP – 208 v – 3 phase, JB on roof.
Evaporator:	8.2 Amp – 120 v – 1 phase, JB on top of cold room.
Lights, Alarm, Heat:	5 Amp – 120 v – 1 phase, JB on top of cold room.
Note:	Extend all final electrical connection points to accessible location at edge of cold room or at edge of adjacent cold room.
Evaporator Drain:	25 mm open drain extended to funnel floor drain.

#	Qty	Description
5A	1	Walk-in Freezer – Receiving Freezer (141)

Dimensions:	5100 mm x 4100 mm x 2750 mm high.
Construction:	Refer to Part II of these Specifications, & Detail #CR-5. Include exterior flashing.
Floor:	Insulated floor within floor depression such that the interior cold room floor is flush with the kitchen floor. Vented under floor by General Contractor.
Vent Inlets/Outlets:	Supply and install stainless steel vent inlets and outlets for underfloor vent system as shown on Detail #CV-1.
Temperature:	- 20° C.
Doors:	One (1) sliding door 1220 mm x 1980 mm high.

Low Profile Evaporator:

Capacity:	17,360 BTU/H
Fan Arrangement:	1
Refrigerant:	R404A
Refrigerant Charge:	22 lbs
Liquid Line Conn.:	13 mm
Suction Line Conn.:	22 mm
Voltage:	208 – 1 phase
Fan Motor HP:	0.07

Condensing Unit:

Capacity:	17,786 BTU/H
Liquid Line Conn.:	9.5 mm
Suction Line Conn.:	16 mm
Discharge Connec.:	26 mm
Saturated Suction T:	-12 degrees C.
Voltage:	208 – 3 phase
Compressor RLA:	12.8
Compressor LRA:	112
Unit Amps:	14.9
Unit MOP:	30 A

Factory Installed Accessories:
Semi-Hermetic compressors.
Receiver with isolating valves.
Liquid sight glass, filter drier.
Solenoid Valve (not installed ship loose)
Replaceable Suction Filter
Suction Accumulator
Electrical control panel including non-fused disconnect switch, air and/or electric defrost timer.
All electrical wires running in conduits.
Compressor discharge thermostat.
High / low pressure control convertible automatic to manual.
Adjustable pressure switches with flexible hoses.
Over Sized and cleanable air cooled Condenser.
Oversized Receiver.
TX Valve.

Services:

Condensing Unit:	3 HP – 208 v – 3 phase, JB on roof.
Evaporator:	11.9 Amp – 208 v – 1 phase, JB on top of cold room.
Lights, Alarm, Heat:	10 Amp – 120 v – 1 phase, JB on top of cold room.
Note:	Extend all final electrical connection points to accessible location at edge of cold room or at edge of adjacent cold room.
Evaporator Drain:	25 mm open drain extended to funnel floor drain.

#	Qty	Description
8	1	Walk-in cooler – Chilled Food Holding (142)

Dimensions:	13500 mm x 5850 mm x 2750 mm high.
Construction:	Refer to Part II of these Specifications, & Detail #CR-5. Include exterior flashing.
Floor:	Insulated floor within floor depression such that the interior cold room floor is flush with the kitchen floor. Vented under floor by General Contractor.
Vent Inlets/Outlets:	Supply and install stainless steel vent inlets and outlets for underfloor vent system as shown on Detail #CV-1.
Temperature:	- 1° C.
Doors:	Two (2) sliding door 1220 mm x 1980 mm high.

2 @ Low Profile Evaporators **(EACH)**: 2 independent refrigeration systems.

Capacity:	22,847 BTU/H
Fan Arrangement:	4 x 1
Refrigerant:	R404A
Refrigerant Charge:	4 lbs
Liquid Temp:	38 degrees C.
Liquid Line Conn.:	13 mm
Suction Line Conn.:	29 mm
Voltage:	208 – 1 phase
Fan Motor HP:	0.07 HP
Fan Motor RPM:	1550

2 @ Condensing Unit **(EACH)**: 2 independent refrigeration systems.

Capacity:	21,800 BTU/H
HP:	2.5
Liquid Line Conn.:	10 mm
Suction Line Conn.:	22 mm
Saturated Suction T:	25 degrees F.
Voltage:	208 – 3 phase
Compressor RLA:	10
Compressor LRA:	63
Unit Amps:	11.1
Unit MOP:	20 A

Factory Installed Accessories:
Semi-Hermetic compressors.
Receiver with isolating valves.
Liquid sight glass, filter drier.
Solenoid Valve (not installed ship loose)
Replaceable Suction Filter
Suction Accumulator
Electrical control panel including non-fused disconnect switch, air and/or electric defrost timer.
All electrical wires running in conduits.
Compressor discharge thermostat.
High / low pressure control convertible automatic to manual.
Adjustable pressure switches with flexible hoses.
Over Sized and cleanable air cooled Condenser.
Oversized Receiver.
TX Valve.

Services:

Condensing Unit:	2 at 2.5 HP – 208 v – 3 phase, JB on roof.
Evaporator:	2 @ 15.5 Amp – 208 v – 1 phase, JBs on top of cold room.
Lights, Alarm, Heat:	10 Amp – 120 v – 1 phase, JB on top of cold room.
Note:	Extend all final electrical connection points to accessible location at edge of cold room or at edge of adjacent cold room.
Evaporator Drain:	2 @ 25 mm open drain extended to funnel floor drain.

#	Qty	Description
13	1	Walk-in Cooler – Raw Foods Cooler 1 (127)

Dimensions:	4000 mm x 4250 mm x 2750 mm high.
Construction:	Refer to Part II of these Specifications, & Detail #CR-4.
Floor:	Insulated floor within floor depression such that the interior cold room floor is flush with the kitchen floor.
Temperature:	5° - 6° C.
Doors:	One (1) sliding door 1220 mm x 1980 mm high. One (1) hinged door 860 mm x 1980 mm high, with window.

Low Profile Evaporator:

Capacity:	16,800 BTU/H
Fan Arrangement:	2 x 1
Refrigerant:	R404A
Refrigerant Charge:	2 lbs

Liquid Temp:	38 degrees C.
Liquid Line Conn.:	13 mm
Suction Line Conn.:	22 mm
Voltage:	120 – 1 phase
Fan Motor HP:	0.05 HP
Fan Motor RPM:	1550

Condensing Unit:

Capacity:	16,300 BTU/H
HP:	2
Liquid Line Conn.:	9.5 mm
Suction Line Conn.:	22 mm
Saturated Suction T:	25 degrees F.
Voltage:	208 – 3 phase
Compressor RLA:	6.8
Compressor LRA:	50
Unit Amps:	7.9
Unit MOP:	15 A

Factory Installed Accessories:
Semi-Hermetic compressors.
Receiver with isolating valves.
Liquid sight glass, filter drier.
Solenoid Valve (not installed ship loose)
Replaceable Suction Filter
Suction Accumulator
Electrical control panel including non-fused disconnect switch, air and/or electric defrost timer.
All electrical wires running in conduits.
Compressor discharge thermostat.
High / low pressure control convertible automatic to manual.
Adjustable pressure switches with flexible hoses.
Over Sized and cleanable air cooled Condenser.
Oversized Receiver.
TX Valve.

Services:

Condensing Unit:	2 HP – 208 v – 3 phase, JB on roof.
Evaporator:	4.6 Amp – 120 v – 1 phase, JB on top of cold room.
Lights, Alarm, Heat:	5 Amp – 120 v – 1 phase, JB on top of cold room.
Note:	Extend all final electrical connection points to accessible location at edge of cold room or at edge of adjacent cold room.
Evaporator Drain:	25 mm open drain extended to funnel floor drain.

#	Qty	Description
14	1	Walk-in Cooler – Raw Foods Cooler 2 (128)

Dimensions:	4000 mm x 4250 mm x 2750 mm high.
Construction:	Refer to Part II of these Specifications, & Detail #CR-4.
Floor:	Insulated floor within floor depression such that the interior cold room floor is flush with the kitchen floor.
Temperature:	5° - 6° C.

Doors: One (1) sliding door 1220 mm x 1980 mm high.
One (1) hinged door 860 mm x 1980 mm high, with window.

Low Profile Evaporator:

Capacity:	16,800 BTU/H
Fan Arrangement:	2 x 1
Refrigerant:	R404A
Refrigerant Charge:	2 lbs
Liquid Temp:	38 degrees C.
Liquid Line Conn.:	13 mm
Suction Line Conn.:	22 mm
Voltage:	120 – 1 phase
Fan Motor HP:	0.05 HP
Fan Motor RPM:	1550

Condensing Unit:

Capacity:	16,300 BTU/H
HP:	2
Liquid Line Conn.:	9.5 mm
Suction Line Conn.:	22 mm
Saturated Suction T:	25 degrees F.
Voltage:	208 – 3 phase
Compressor RLA:	6.8
Compressor LRA:	50
Unit Amps:	7.9
Unit MOP:	15 A

Factory Installed Accessories:
Semi-Hermetic compressors.
Receiver with isolating valves.
Liquid sight glass, filter drier.
Solenoid Valve (not installed ship loose)
Replaceable Suction Filter
Suction Accumulator
Electrical control panel including non-fused disconnect switch, air and/or electric defrost timer.
All electrical wires running in conduits.
Compressor discharge thermostat.
High / low pressure control convertible automatic to manual.
Adjustable pressure switches with flexible hoses.
Over Sized and cleanable air cooled Condenser.
Oversized Receiver.
TX Valve.

Services:

Condensing Unit:	2 HP – 208 v – 3 phase, JB on roof.
Evaporator:	4.6 Amp – 120 v – 1 phase, JB on top of cold room.
Lights, Alarm, Heat:	5 Amp – 120 v – 1 phase, JB on top of cold room.
Note:	Extend all final electrical connection points to accessible location at edge of cold room or at edge of adjacent cold room.
Evaporator Drain:	25 mm open drain extended to funnel floor drain.

#	Qty	Description
15	1	Walk-in Cooler – Prepped Food Cooler 1 (131)

Dimensions: 4000 mm x 4270 mm x 2750 mm high.

Construction: Refer to Part II of these Specifications, & Detail #CR-1.

Floor: Insulated floor within floor depression such that the interior cold room floor is flush with the kitchen floor.

Temperature: 5° - 6° C.

Doors: Two (2) sliding doors 1220 mm x 1980 mm high.

Low Profile Evaporator:

Capacity:	16,800 BTU/H
Fan Arrangement:	2 x 1
Refrigerant:	R404A
Refrigerant Charge:	2 lbs
Liquid Temp:	38 degrees C.
Liquid Line Conn.:	13 mm
Suction Line Conn.:	22 mm
Voltage:	120 – 1 phase
Fan Motor HP:	0.05 HP
Fan Motor RPM:	1550

Condensing Unit:

Capacity:	16,300 BTU/H
HP:	2
Liquid Line Conn.:	9.5 mm
Suction Line Conn.:	22 mm
Saturated Suction T:	25 degrees F.
Voltage:	208 – 3 phase
Compressor RLA:	6.8
Compressor LRA:	50
Unit Amps:	7.9
Unit MOP:	15 A

Factory Installed Accessories:
Semi-Hermetic compressors.
Receiver with isolating valves.
Liquid sight glass, filter drier.
Solenoid Valve (not installed ship loose)
Replaceable Suction Filter
Suction Accumulator
Electrical control panel including non-fused disconnect switch, air and/or electric defrost timer.
All electrical wires running in conduits.
Compressor discharge thermostat.
High / low pressure control convertible automatic to manual.
Adjustable pressure switches with flexible hoses.
Over Sized and cleanable air cooled Condenser.
Oversized Receiver.
TX Valve.

Services:

Condensing Unit:	2 HP – 208 v – 3 phase, JB on roof.
Evaporator:	4.6 Amp – 120 v – 1 phase, JB on top of cold room.
Lights, Alarm, Heat:	5 Amp – 120 v – 1 phase, JB on top of cold room.
Note:	Extend all final electrical connection points to accessible location at edge of cold room or at edge of adjacent cold room.
Evaporator Drain:	25 mm open drain extended to funnel floor drain.

#	Qty	Description
16	1	Walk-in Cooler – Prepped Food Cooler 2 (132)

Dimensions: 3700 mm x 4270 mm x 2750 mm high.

Construction: Refer to Part II of these Specifications, & Detail #CR-1.

Floor: Insulated floor within floor depression such that the interior cold room floor is flush with the kitchen floor.

Temperature: 5° - 6° C.

Service Chase: Supply and install matching housing to conceal refrigeration lines for Item #40, from finished floor to ceiling. Provide removable access panels where required.

Doors: One (1) sliding door 1220 mm x 1980 mm high.

Evaporator:

Capacity:	16,800 BTU/H
Fan Arrangement:	2 x 1
Refrigerant:	R404A
Refrigerant Charge:	2 lbs
Liquid Temp:	38 degrees C.
Liquid Line Conn.:	19 mm
Suction Line Conn.:	22 mm
Voltage:	120 – 1 phase
Fan Motor HP:	0.05 HP
Fan Motor RPM:	1550

Condensing Unit:

Capacity:	16,300 BTU/H
HP:	2
Liquid Line Conn.:	9.5 mm
Suction Line Conn.:	22 mm
Saturated Suction T:	25 degrees F.
Voltage:	208 – 3 phase
Compressor RLA:	6.8
Compressor LRA:	50
Unit Amps:	7.9
Unit MOP:	15 A

Factory Installed Accessories:
Semi-Hermetic compressors.
Receiver with isolating valves.
Liquid sight glass, filter drier.
Solenoid Valve (not installed ship loose)
Replaceable Suction Filter
Suction Accumulator
Electrical control panel including non-fused disconnect switch, air and/or electric defrost timer.
All electrical wires running in conduits.
Compressor discharge thermostat.
High / low pressure control convertible automatic to manual.
Adjustable pressure switches with flexible hoses.

Over Sized and cleanable air cooled Condenser.
Oversized Receiver.
TX Valve.

Services:

Condensing Unit:	2 HP – 208 v – 3 phase, JB on roof.
Evaporator:	4.6 Amp – 120 v – 1 phase, JB on top of cold room.
Lights, Alarm, Heat:	5 Amp – 120 v – 1 phase, JB on top of cold room.
Note:	Extend all final electrical connection points to accessible location at edge of cold room or at edge of adjacent cold room.
Evaporator Drain:	25 mm open drain extended to funnel floor drain.

#	Qty	Description
40	1	Air cooled remote refrigeration package (NIC By Owner)

Scope: Obtain from Owner and install this item according to manufacturer's instructions. Supply and install all requires refrigerant piping, refrigerant, insulation, control wiring and all necessary accessories and fittings.

#	Qty	Description
63	1	Walk-in Cooler – SGMP Cooler (105)

Dimensions: 4860 mm x 3650 mm x 2750 mm high.

Construction: Refer to Part II of these Specifications, & Detail #CR-4.

Floor: Insulated floor within floor depression such that the interior cold room floor is flush with the kitchen floor.

Temperature: 5° - 6° C.

Doors: One (1) hinged door 860 mm x 1980 mm high, with window.
Four (4) reach-in hinged doors 760 mm x 1525 mm high.

Low Profile Evaporator:

Capacity:	20,400 BTU/H
Fan Arrangement:	3 x 1
Refrigerant:	R404A
Refrigerant Charge:	3 lbs
Liquid Temp:	38 degrees C.
Liquid Line Conn.:	13 mm
Suction Line Conn.:	22 mm
Voltage:	120 – 1 phase
Fan Motor HP:	0.05 HP
Fan Motor RPM:	1550

Condensing Unit:

Capacity:	20,500 BTU/H
HP:	2
Liquid Line Conn.:	9.5 mm
Suction Line Conn.:	22 mm
Saturated Suction T:	25 degrees F.
Voltage:	208 – 3 phase

Compressor RLA: 8.8
Compressor LRA: 46
Unit Amps: 9.9
Unit MOP: 20 A

Factory Installed Accessories:
Semi-Hermetic compressors.
Receiver with isolating valves.
Liquid sight glass, filter drier.
Solenoid Valve (not installed ship loose)
Replaceable Suction Filter
Suction Accumulator
Electrical control panel including non-fused disconnect switch, air and/or electric defrost timer.
All electrical wires running in conduits.
Compressor discharge thermostat.
High / low pressure control convertible automatic to manual.
Adjustable pressure switches with flexible hoses.
Over Sized and cleanable air cooled Condenser.
Oversized Receiver.
TX Valve.

Services:
Condensing Unit: 2 HP – 208 v – 3 phase, JB on roof.
Evaporator: 4.6 Amp – 120 v – 1 phase, JB on top of cold room.
Lights, Alarm, Heat: 5 Amp – 120 v – 1 phase, JB on top of cold room.
Note: Extend all final electrical connection points to accessible location at edge of cold room or at edge of adjacent cold room.
Evaporator Drain: 25 mm open drain extended to funnel floor drain.

#	Qty	Description
63A	1	Walk-in Freezer - SGMP Cooler (106)

Dimensions: 4850 mm x 3650 mm x 2750 mm high.

Construction: Refer to Part II of these Specifications, & Detail #CR-5.

Floor: Insulated floor within floor depression such that the interior cold room floor is flush with the kitchen floor. Vented under floor by General Contractor.

Vent Inlets/Outlets: Supply and install stainless steel vent inlets and outlets for underfloor vent system as shown on Detail #CV-1.

Temperature: - 20° C.

Doors: Two (2) hinged door 860 mm x 1980 mm high.
Four (4) reach-in hinged doors 760 mm x 1525 mm high.

Low Profile Evaporator:
Capacity: 27,660 BTU/H
Fan Arrangement: 5 x 1
Refrigerant: R404A
Refrigerant Charge: 6 lbs
Liquid Line Conn.: 22 mm
Suction Line Conn.: 26 mm
Voltage: 208 – 1 phase

Fan Motor HP: 0.07 HP

Condensing Unit:
Capacity: 28,282 BTU/H
Liquid Line Conn.: 13 mm
Suction Line Conn.: 16 mm
Discharge Connec.: 26 mm
Saturated Suction T: -12 degrees C.
Voltage: 208 – 3 phase
Compressor RLA: 23.6
Compressor LRA: 161
Unit Amps: 28.4
Unit MOP: 60 A

Factory Installed Accessories:
Semi-Hermetic compressors.
Receiver with isolating valves.
Liquid sight glass, filter drier.
Solenoid Valve (not installed ship loose)
Replaceable Suction Filter
Suction Accumulator
Electrical control panel including non-fused disconnect switch, air and/or electric defrost timer.
All electrical wires running in conduits.
Compressor discharge thermostat.
High / low pressure control convertible automatic to manual.
Adjustable pressure switches with flexible hoses.
Over Sized and cleanable air cooled Condenser.
Oversized Receiver.
TX Valve.

Services:
Condensing Unit: 4 HP – 208 v – 3 phase, JB on roof.
Evaporator: 19.1 Amp – 208 v – 1 phase, JB on top of cold room.
Lights, Alarm, Heat: 10 Amp – 120 v – 1 phase, JB on top of cold room.
Note: Extend all final electrical connection points to accessible location at edge of cold room or at edge of adjacent cold room.
Evaporator Drain: 25 mm open drain extended to funnel floor drain.

Execution

2.6 INSTALLATION

.1 Provide appropriate protection apparatus.

.2 Install in accordance with manufacturers' 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 Clear drain holes in floor, in freezer area, and ensure that underslab vapour barrier is punctured to allow drainage to drains and vent piping.

.5 Insulate to prevent electrolysis between metal and concrete by applying coating of asphaltic paint to metal surface, applied in accordance with manufacturer's instructions. Insulation to be dry before assembling floor panels in place.

.6 Unless otherwise indicated, install units within 25 mm of building walls, with minimum 25 mm clearance between top of unit and room ceiling. Fasten screeds to building and/or wearing floor in accordance with manufacturer's instructions.

.7 Caulk around perimeter of floor panels and screeds after installation on floor slab.

.8 Fill space between perimeter of floor panels and edge of floor depression with concrete or non-shrink grout and trowel flush with building floor.

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

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

.11 Install removable closure panels, cover strips, and angles.

.12 Supervise installation of thresholds, heaters and urethane insulation for floors.

2.7 CLEANING AND ADJUSTING

.1 Upon completion of Work:

.1 Clean equipment and apparatus Division 1 - Quality Control.
.2 Remove protective coverings and test and adjust operating equipment.
.3 Re-finish damaged coatings and finishes.

2.8 COMMISSIONING

.1 Refer to Sections 01 91 00, 01 91 01 and 01 91 41 for Commissioning Requirements.

.2 Provide full commissioning services for all items of equipment provided by the Owner as well as items supplied under Division 11.

.3 Submit a schedule of demonstration by equipment suppliers four (4) weeks prior to Substantial Completion of the Work. List the exact time for each equipment demonstration. Demonstrations to include instruction and training on the proper use and maintenance of equipment. Once the approved schedule is returned, make all necessary arrangements for the demonstration sessions..

.4 Provide required operating and maintenance instructions as specified in Division 1

.5 Submit three (3) bound manuals of operating instructions, maintenance instructions, and spare parts list for each item of equipment. Use numbered tabs to separate numbered/indexed items in the manual. Identify the service company for each item in an appendix to the manuals. Submit manuals at least two (2) weeks prior to the equipment demonstrations during the commissioning phase. Submit copies of As-Built Drawings and Reviewed Shop Drawings.

.6 Provide Start-up Forms and Static Verification Forms and Functional Test Forms as required by Division 1 Specifications. Submit sample forms for approval four weeks prior to the end of installation.

.1 **Sample Static Verification Form:** This form collects the nameplate information of each piece of equipment and verifies that what was specified is what was actually installed.

.2 **Sample Static Verification Form: Sample Start - Up Form:** This form is typically provided by the manufacturer and is essentially a check list of what needs to be verified before a piece of equipment is started for the first time.

.3 **Functional Test Form:** This form itemize the various tests that are required to ensure that the equipment is working properly. The manufacturer may also have one available to use..

END OF SECTION