1.0 GENERAL

1.1 RELATED REQUIREMENTS

.1	Rough Carpentry	Section 06 08 99
.2	Joint Sealants	Section 07 92 00
.3	Special Wall Surfacing	Section 09 77 00
.4	Mechanical	Division 21 - 23
.5	Electrical	Division 26

1.2 DEFINITION

.1 Abbreviations:

.1	S.S.	-	Stainless Steel
.2	C/W	-	Complete With
.3	A.F.F.	-	Above Finished Floor
.4	A	-	Amperes
.5	V	-	Volts
.6	CY	-	Cycle
.7	P	-	Phase
.8	Pl. lam.	-	Plastic Laminate
.9	Kw	-	Kilowatt
.10	kPa	-	Kilopascals
.11	J.B.	-	Junction Box
.12	L/S	-	Litres per Second
.13	L.E.D	-	Light Emitting Diode
.14	mm	-	Millimetres
.15	C	-	Celsius
.16	C.P.	-	Chrome Plated
.17	I.P.S.	-	Inside Pipe Size
.18	N.I.C.	-	Not in Contract
.19	L.C.	-	Load Centre
.20	CBP	-	Circuit Breaker Panel

1.3 SECTION INCLUDES

.1 General:

.1 The work listed here includes, but is not limited to, the provision of all equipment indicated on the drawings and listed in the specifications together with labour, material, tools, plant, delivery, un-crating, setting-in-place of equipment, erecting of prefabricated insulated walk-in type refrigerated and frozen room assemblies, levelling, final assembly of equipment items shipped knocked down or in sections and cleaning herein ready for final connection of services by mechanical and electrical trades.

.2 The work listed here includes coordination of the schedule for the manufacture, delivery and setting into place of the food service equipment in conjunction with the overall construction schedule. This also includes the delivery and set-into-place of all large foodservice equipment that may not fit through normal building doorways such as but not limited to mechanical refrigeration system components, dishwashing and waste management system components or exhaust ventilators. Ensure that there is sufficient access into the building for the

delivery and set into place of all foodservice equipment, mechanical refrigeration system components, prefabricated insulated panels for walk-in refrigerated and frozen rooms, conveyors or ware washing equipment etc.

.2 Electrical:

.1 All work shall comply with the standards for material and workmanship specified under Division 26.

.2 Supply and installation of low water cut-off devices for any equipment in which immersion type electric heating elements are utilized.

.3 Supply and installation of all motors integral with equipment complete with starters, Motor control centers and internal thermal overload protection.

.4 Supply and installation of all internal wiring on custom fabricated items in a concealed and well supported manner and terminated inside circuit breaker panels or junction boxes ready for final connection by the electrical trades. All equipment shall carry CSA and/or ULC approval.

.5 Supply and installation of all necessary junction boxes and circuit breaker panels (electrical load centres) required to terminate internal wiring within custom fabricated equipment, exhaust ventilator(s) exhaust hood(s) and conveyors etc.

.6 Tag each multiple electrical wire or cable used in any custom fabricated piece of equipment to indicate the item serviced. When circuit breaker panels are used, identify each circuit.

.7 Supply and installation of waterproof panels and controls in all wet areas.

.8 Supply and installation of waterproof electrical outlets on all custom fabricated equipment, conveyors and ware washing/waste management equipment.

.9 On open tables, recess outlets in stainless steel housing under table top.

.10 On enclosed tables and counters, recess outlets in stainless steel insert pans in counter front.

.11 Supply and installation of switches for all lights in custom fabricated items.

.12 Supply and mount interior low temperature fluorescent lights with quick start ballasts within prefabricated walk-in refrigerator and frozen room assemblies. Physically mount all interior lights ready for final connection by Division 26.

.13 Factory pre-wire door heaters within pre-fabricated insulated wall panels and run wiring to a junction box located on top of the walk-in room assembly.

.3 Mechanical:

.1 All work shall comply with the standards for material and workmanship specified under Division 21-23.

.2 Provision of all faucets complete with aerators and replaceable seats, for final assembly, install and connection by appropriate contractor.

.3 Supply of chrome plated overflow assemblies, drain fittings and traps with tail pieces for all sink type assemblies.

.4 Supply of any pressure regulating valves on domestic hot and cold water, low temperature chilled water, gas, steam or condensate lines for equipment supplied herein.

.5 Conceal and support of all piping and accessories within custom fabricated equipment.

.4 Prefabricated, Insulated Walk-in Type Refrigerated and Frozen Room Assemblies

.1 Supply, installation and erection of all prefabricated, insulated panels for walk-in type refrigerated and frozen room assemblies including ceiling and evaporator coil suspensions.

.2 Supply, installation and erection of all prefabricated insulated panels required to

insulate building structural columns that occur within walk-in type refrigerated and frozen room assemblies.

.3 Supply and set into place of all over head horizontal structural supports and hanging rods required for suspension of ceiling panels for prefabricated walk in type refrigerated and frozen room assemblies and evaporator coils.

.4 Supply and installation of internal and external bumpers as specified for all pre-fabricated, insulated walk-in type refrigerated or frozen room assemblies.

.5 Supply and installation of all door assemblies specified as part of the walk-in structures.

.6 Supply and installation of interior low temperature fluorescent lights with quick start ballasts within prefabricated walk-in refrigerator and frozen room assemblies.

.7 Supply and installation of interior light switches within pre-fabricated insulated walk in refrigerated and frozen room assemblies. Factory pre-wire light switches within pre-fabricated insulated door assemblies and run wiring to a junction box located on top of the walk-in room assembly.

.8 Supply and installation of door heaters. Factory pre-wire door heaters within pre-fabricated insulated wall panels and run wiring to a junction box located on top of the walk-in room assembly.

.9 Supply and installation of internal bracings inside of the foamed urethane walk in panels required to support external bumpers or other fixtures attached to the prefabricated walk-in type panels.

.10 Supply and installation of double pane Low E (i.e. argon gas filled) double pane viewing window, heated Vacuum Pressure Release Valves within pre-fabricated insulated wall panels for walk-in refrigerated room assemblies as indicated on drawings and the itemized portion of this specification. Viewing windows to be 20" high x 14" wide.

.11 Supply and installation of triple pane Low E (i.e. argon gas filled) viewing window, heated Vacuum Pressure Release Valves within pre-fabricated insulated wall panels for walk-in frozen room assemblies as indicated on drawings and the itemized portion of this specification. Viewing windows to be 20" high x 14" wide.

.5 Mechanical Refrigeration Systems

.1 Refrigeration equipment and system shall be provided to maintain stated temperatures for each unit or room. Plant sizes given in this documentation are guides only. Contractor to verify heat load and size equipment to maintain design temperatures for normal commercial kitchen use. All mechanical piping and materials installed under this section shall be in accordance with Divisions 23.

.2 Installation under this section should include:

- .1 Receiving and placing the complete refrigeration system,
- .2 Installation of all supplied evaporator coils,
- .3 All required refrigeration piping, fittings and insulation,
- .4 Supply and install thermostats for cooler and / or freezer rooms
- .5 Supply and install thermostats for remote refrigerated equiment
- .6 Control valves and switches
- .7 Tubing and fittings, pipe and tube supports and insulation
- .8 All other installation materials to complete project
- .9 Tubing to be hard drawn type l copper – refrigeration grade
- .10 Braze tubing connections with silphos
- .11 Flush with nitrogen and hold under 200 p.s.i. Pressure for 24 hours
- .12 Evacuate the piping before before charging system with refrigerant
- .13 Adjust system to operate as required

.3 Installation of refrigeration components shall adhere to the installation guidelines available from the manufacturers of the components. Installation shall be done by experienced installers.

.4 Refrigeration installers shall provide guidance and/or diagrams to the electrical trade for the controls wiring as may be required.

.5 Required Components for the Food Services Refrigeration System.

.1 General

.1 Refrigerant type: R-404a

.2 Compressor class: Hermetic

.6 Liquid

.1 Provide liquid line filter-drier and sightglass Insulation to be ½" Armaflex or equivalent

.7 Suction

.1 Suction lines insulation thickness shall be ½" thick wall. Armaflex or equivalent.

.2 Supply and installation evaporator coil fan motors, time clocks, room thermostats, solenoid valves and defrost heaters ready for final electrical connection by Division 26.

.6 Exhaust Ventilator(S), Hoods and Fire Suppression Systems

.1 Supply, set-into-place and/or suspension of all specified exhaust ventilator(s) and hood(s).

.2 Supply and set into place of all hanging rods required for the suspension of exhaust ventilator(s) or (hoods).

.3 Supply and set-into-place of exhaust ventilator(s) control panels complete with control relays as required for interlock to the building central fire alarm panel.

.4 Supply and set-into-place of fire suppression electrical control panel(s) and Automan(s) complete with piping, bottles, fusible links as specified, release mechanisms and all other necessary accessories and components to form a complete operational and approved system.

.5 Supply and installation of remote fire pull stations for the exhaust ventilator/fire suppression system.

.6 The supply and installation of remote fire suppression system shall be in accordance with all requirements and regulations of Underwriters Laboratories of Canada, N.F.P.A. Code 96, BC Building Code and other local municipal authority having jurisdiction.

.7 Supply of emergency mechanical gas valve(s) for installation by the mechanical contractor into the gas supply line.

.7 Warewashing and Waste Management System

.1 Contractor will be responsible for the manufacture, supply, relocation and set-in-place and on-site commissioning of the entire ware washing and waste management system.

.2 Contractor to be responsible to ensure that all these items function together as a complete and inter-related system, the entire system is fully operational and that all of the system sub-component parts are properly integrated.

.8 Miscellaneous

.1 Supply and installation of all hardware and standard accessories normally part of the equipment whether shown and/or specified or not; ie locks, catches, handles, hinges, etc.

.2 Provision of rubber button feet or pads under any piece of equipment that will rest on a counter.

.3 Caulking and sealing of equipment to walls, curbs, bases, adjacent units and between any dissimilar materials. Use an approved silicone sealer for gaps under 8mm and stainless steel trim strips and sealer for wider gaps. Prepare area being siliconed prior to silicone application.

.4 Securing of all permanent equipment to floor or base. Use stainless steel shims for levelling.

.5 Supply and installation of all stainless steel strips and filler pieces necessary to properly finish any individual or combined set of pieces of equipment as part of the contract.

.6 Protection, identification and recessing of all controls, pilot lights, switches and valves on any item of equipment.

.7 Provision of all necessary access panels within each piece of equipment to allow for proper maintenance and service. Allow access when two (2) or more units are adjacent to each other.

.8 Supply of all standard equipment accessories normally furnished with all items specified whether indicated or not.

.9 Provision of all inserts, bolts, anchors, sleeves, ferrules, sleepers and other assorted hardware as may be necessary for the proper anchorage, fixing or attachment of equipment to the building.

.10 Verification of the dimensions and services of all pieces of equipment that may be supplied by the Owner but are to become a part of a unit specified under this work in order to ensure a proper fit and co-ordination of installation.

.9 Installation

.1 The contractor shall provide an installation crew to ready equipment for final services connections by mechanical and electrical trades. The installation crew is to include at least one journeyman sheetmetal tradesperson with at least 2 years' experience in stainless steel fabrication.

.2 Gaps and spaces between all equipment and walls, ceilings, floors and adjoining units not portable and with enclosed bodies are to be completely sealed against entrance of food particles or vermin. Close gaps and spaces by means of trim strips, welding, soldering or commercial joint materials as suited to the nature of the equipment and in compliance with local Health Department regulations.

.3 Sealant to be mildew resistant silicone- Dow Corning 786 or equal - in either clear or approved color matching surrounding surfaces. Apply in accordance to manufacturer's directions with a smooth and sealed finish.

.4 Equipment located against a wall or column is to be installed tight to same and sealed with silicone caulking or stainless steel filler strips.

.5 The Contractor shall provide the fasteners, anchors, bolts and similar items required to anchor equipment to building components.

.6 Provide Seismic Restraint of Commercial Kitchen Equipment in accordance with SMACNA Guidelines.

1.4 QUALITY ASSURANCE

.1 The work of this section shall be executed by qualified Foodservice Equipment Sub-Contractors such as foodservice equipment dealer/custom stainless steel fabricator, manufacturer of prefabricated insulated walk-in type refrigerated and frozen room panels, foodservice refrigeration specialists, manufacturer of blast chillers, manufacturers of ware washing/waste management systems and conveyor systems.

.2 Provide the name of the authorized service agent for each and every component of the mechanical refrigeration system.

.3 Examine the drawings, specifications and the site to become aware of all existing conditions and limitations and to ensure that all of the work called for will be included in the tender submission.

.4 All equipment and components shall be the latest model or issuance and shall be new and unused in every respect.

1.5 SUBMITTALS

.1 Provide shop drawings and product data in accordance with Section 01 33 00 Submittals. All shop drawings for this project shall use metric units.

.2 All fabricated items and assemblies of equipment shall be completely illustrated by shop drawings with detailed descriptions, clearly indicated methods of construction, gauges, assembly, fastenings and services, etc.

.3 Drawings depict equipment design intent only. It is the responsibility of the contractor to prepare shop drawings in conjunction with the drawings, specifications, mechanical and electrical data, details and other information. The contractor shall be responsible to coordinate all shop drawings with Architectural and Engineering plans, as built site conditions and the work of all relevant Sections.

.4 Identify and explain any variation in the shop drawings that do not adhere to the original specifications or details. Advise Departmental Representative in writing of any conditions that would limit or adversely affect the design intent.

.5 Ensure that all component parts and assemblies of each piece of equipment will support the loads anticipated without detriment to function, safety or appearance.

.6 Prepare shop drawings on the same size sheet as plans and elevations, in a scale of not less than 1:50 for plans and 1:10 for details and sections so as to clearly illustrate the construction and arrangement of equipment.

.7 Prepare fully dimensioned "roughing-in" and final connection point drawings for mechanical and electrical services. Separate mechanical and electrical, or combined drawings, may be submitted. In either case, drawings must be a minimum of 1:50 Include walk-in and fire suppression schematics and any pertinent installation diagrams including dimensioned "sleeving" drawing.

.8 Rough-in and final connection point drawings must include a list of symbols for each type of connection and must show the location of connections on equipment as well as the location of the rough-in point for all mechanical and electrical services. Both connections to the equipment and the rough-in point must be dimensioned so as to show the relative distances from architectural wall reference points as well as the height above the finished floor.

.9 Submit equipment data sheets and shop drawings in the following order:
- .1 Catalogue cuts and illustrations.
- .2 Plan lay out drawing with mechanical and electrical "roughing-ins" and "connection points"

.3 "Sleeving" drawing
.4 Base, curb and depressions
.5 Custom fabricated items

.10 Review of shop drawings is general and applies to design only, it is not intended to serve as a final check and shall not relieve the contractor of the responsibility for errors in dimensions, quantity, material or interfacing as required to complete the intent of the design.

.11 Rough-in and connection point drawings will not be reviewed unless the catalogue cuts and illustrations are submitted first.

2.0 PRODUCTS

2.1 GENERAL

.1 All equipment supplied under this contract shall be made of the best grade materials and with first class workmanship and shall be in strict accord with the Drawings and Specifications.

.2 The specifications attached hereto shall be considered the minimum acceptable standard and all equipment supplied shall be within the intent of approved shop drawing and specification.

.3 Unless otherwise specified in the Itemized List of Equipment, fabricated equipment referred to as "stainless steel" shall incorporate the materials listed in 2.2 wherever necessary.

.4 Trademarks and labels, including applied trademarks and labels are not acceptable in the finished work, except those required for operating instructions.

2.2 MATERIALS

.1 Materials for fixed surfaces shall be impervious to moisture, corrosion resistant, smooth and able to withstand regular cleaning and sanitizing.

.2 Stainless steel, denoted by the abbreviation "S.S." in this specification shall be ASTM-A167-81A, (18-8 Analysis) type 304 cold rolled and annealed, No. 4 finish one side, 180 grit finish free of buckles, pits, warps and imperfections. Ensure that direction of grain matches throughout units.

.3 Stainless steel tubing shall be 304, seamless and welded, No. 4 finish, 38mm square for all legs and bracing.

.4 Nuts, bolts, screws, washers and other fastenings shall be type 304 stainless steel.

.5 Galvanized steel sheet, generally referred to as Satin coat; zinc coated, 380 gms/sq. m. Where such material is used as an exposed surface, it shall be finished with one (1) coat of primer and two (2) coats of air dry enamel, silver gray unless otherwise specified.

.6 Structural steel shall be new material, conforming to recognized standards, grade 300W, cleaned and primed.

.7 Gauges of material refer to U.S. Standard Gauges.

.8 Plywood to be Douglas Fir, minimum 5 ply construction conforming to CSA 0121, good two (2) sides, waterproof where required.

.9 Gauges are as follows:
- .1 1.0 mm - 20 ga.
- .2 1.2 mm - 18 ga.
- .3 1.6 mm - 16 ga.
- .4 2.0 mm - 14 ga.
- .5 3.0 mm - 12 ga.

2.3 ELECTRICAL COMPONENTS

.1 Electrical parts supplied under this Section shall be compatible with materials specified for use on this project. Refer to Division26. Receptacles shall have stainless steel cover plates and screws. Cords and caps shall be approved type, matching the receptacles for which they are intended.

.2 Make receptacles, junction boxes and breaker panels easily accessible without dismantling equipment.

.3 Terminate wiring within equipment at load centre or junction boxes with wires identified by Item No. and load.

.4 Properly rate and ground all receptacles.

.5 Supply load centres with bolt on "qwik-gard" type circuit breakers, or approved equal, properly rated and identified. Include two (2) 20amp. spare breakers. Face of panel shall be easily accessible behind stainless steel hinged door of a compartment that must be insulated from local heat.

.6 Equip 3-phase motors with magnetic starters with thermal overload protection on each of the three phases.

.7 Equip single-phase motors of fractional horsepower rating and those ranging up to and including .746kW with manual starters with overload protection. Motors rated over 746kW must have magnetic starter with overload protection.

.8 Control circuits to be 120 V maximum.

.9 Provide all lighting fixtures with ballasts and lamps for designated equipment with colour corrected lamps and controls or switches wired to an easily accessible common junction box for power connection.

.10 Fit all portable and mobile electrical equipment with cord and plug suited for the electrical characteristics and outlets specified for the equipment. Include grounding conductor in the cord.

2.4 PLUMBING COMPONENTS

.1 Plumbing components supplied under this section shall be compatible with materials specified for use on this project. Refer to Division 22.

.2 All control valves and faucets, pipe fittings, waste and tail pieces etc., must be brass chrome plated, bright finish, new, best quality and comply with applicable codes.

.3 Faucets shall be commercial grade units supplied by T&S Brass or Fisher Manufacturing or approved equal.

2.5 MISCELLANEOUS

.1 Casters to be Darnell, Colson, Kilian, Jarvis black neoprene non-marking rubber tired, or approved equal, 60 shore hardness, doughnut shaped, ball bearing, equipped with brakes as noted, sized to suit specific usage, zinc finished. Plate type shall be securely bolted to frame. Shank casters shall be threaded type c/w bushing. Bushing shall be welded and upright. Bolts, nuts and lock washers shall be stainless steel. All casters supplied shall be made by the same manufacturer. Casters shall be supplied on each unit to suit its particular application so that is runs freely and handles easily, minimum of 4" diameter and 200 lbs. capacity per caster.

.2 Bumpers shall be Colson #6915, or approved equal, for wrap around type set into stainless steel channel and #6927 for corner type c/w a 1.6mm S.S. exterior casing. Secure bumpers on equipment at identical height and seal any exposed gap.

.3 Garbage containers shall be yellow Rubbermaid #2620, or approved equal, complete with lid and #2623 Dolly, or approved equal.

.4 Cutting boards shall be white thermoplastic polyethylene, with a hardness of 65-70 durometer and all surfaces polished, as supplied by Rubbermaid Products Inc., Johnson Plastics or approved equal.

.5 All sealants shall be one-part silicone type, tack free in less than one hour with complete cure achieved to 6mm depth in less than 24 hours. Sealant must not significantly alter its properties when set.

.6 Sealant to remain flexible and resistant to damage from all normal environments of a commercial kitchen. It must not support the growth of bacteria, mould or fungi or discolour.

.7 Sealant to be clear or as required to suit colour of surrounding materials.

2.6 HARDWARE

.1 Refrigerator door hardware: Self closing, heavy duty stainless steel offset pivot hinges with magnetic gaskets and 430stainless steel door frame and tamper proof cylinder locks and two (2) keys per lock.

.2 Stainless steel drawer slides: Component Hardware Model S52 series, or approved equal, for standard and refrigerated units.

.3 Drawer locks: Component Hardware Model P30 series, or approved equal, stainless steel face (drawers shall not be keyed alike). Supply two (2) keys per lock and hand over to the Owner or Consultant.

.4 Provide locks on all doors and drawers. Key each section of the foodservices areas With a different series of locks, two (2) keys per lock.

.5 Casters shall be cadmium plated, steel disc cushion non-marking rubber tired wheels with adjustable cup and cone ball bearings. Caster swivel with two rows of ball bearings running in hardened raceways. Capacity per caster, minimum 100 kg. All stem casters with expanding type fittings of size to suit tube. Plate casters mounted with stainless steel bolts and lock washers for easy replacement. All casters on mobile equipment lubricated for efficient use in varied temperatures of kitchen, walk-in refrigerators and freezers. Casters on mobile equipment equipped with cart-washable casters with grease nipples to assure adequate watertight lubrication.

.6 Pilaster strips, stainless steel 20mm wide with 13mm adjustment.

.7 Clips for shelves shall be die formed stainless steel.

3.0 EXECUTION

3.1 WELDING

.1 All welding shall conform to the requirements of CSA specifications and be performed by fabricators who are approved by the Canadian Welding Bureau or ITA and to CSA specifications. Exposed welds shall be filed or ground smooth and flush and polished to match adjacent surfaces. All exposed welds shall be continuous.

.2 Electric seamless welding shall utilize low carbon filler rod, coated with non-carbonaceous flux, with sufficient chromium and nickel so that the deposited metal and the original metal have the same composition.

.3 Welds shall be free from pits, cracks, discolouration and other imperfections.

.4 Welded joints shall be butt fitted, properly jigged, continuous, ground smooth and polished for both exposed conditions as well as unexposed welds on underside of equipment.

.5 All seams and joints are to be shop welded or soldered as the nature of the material may require. Welds are to be ground smooth and polished to match original finish.

.6 Butt joints made by spot welding or riveting straps under seams and filling with solder, puddled welds and exposed screws are not acceptable.

.7 Framework of galvanized steel is to be welded construction. Where galvanizing has been burned off, the weld must be touched up with high grade aluminum paint.

3.2 FABRICATION

.1 Before fabrication commences, check all dimensions and conditions at the building site, including means of access into and through the building to the area where equipment is to be set in place, for all conditions affecting the delivery and installation of the equipment.

.2 Fix and assemble work in the shop wherever possible. Execute the work in accordance with details and shop drawings that have been reviewed and accepted by the consultant. Where complete or final shop fabrication is not possible, make a trial assembly in the shop prior to delivery.

.3 Workmanship shall be of the best grade modern shop and field practice for the manufacturers who specialize in this work. Work to be completed by recognized fabricator/manufacturers specializing in this work.

.4 Fabricate and erect work square, plumb, straight and accurately fitted. Provide adequate reinforcing and anchorage in all places.

.5 Insulate where necessary to prevent electrolysis between metal to metal or metal to masonry or concrete contact.

.6 All drillings to be reamed and exposed edges left clean and smooth.

.7 All straight lengths shall be one piece throughout, with all seams, including field joints, continuously welded. Radiused corners must be welded and polished to match original finish.

.8 Conceal joints and connections wherever possible. Intermediate joints between supports are not acceptable.

.9 Machine dressed work and finished work shall be free from drag, feathers or roughness of any kind. Remove machine marks by sanding.

.10 Pop rivets shall not be used unless clearly noted on shop drawings, and then only if such drawings have been reviewed and accepted by the Consultant.

.11 The methods of construction, reinforcement and anchorage, as well as details of finish, fitting and jointing, and other data indicated on shop drawings shall be accurately followed. No deviations from shop drawings that have been reviewed and accepted will be permitted during the construction of equipment or installation.

.12 The gauge of metal and methods of construction shall in all cases be adequate for the various conditions to be met, with the requirements of the design details and Specifications considered as minimum. Finished equipment shall be rigid when assembled and installed.

.1 Typical Gauges:

.1 16 gauge (1.587 mm) Utilized for all free standing sinks, dishtables, countertops, overshelves, single pan doors, stainless steel slides, stainless steel grids and undershelves. Hat sections/channels; unexposed galvanized, exposed stainless steel. Exposed shelf brackets. Vertical surfaces.

.2 18 gauge (1.27 mm) Utilized for the chassis of all fixtures, double pan doors and drawer fronts.

.3 20 gauge (0.96 mm) Utilized for all drawer bodies and door linings, refrigerator linings, drawer pans with 2B finish, dishwasher ducts, or as specified

.13 All fastenings and fittings shall be stainless steel, type 304 unless otherwise specified. All bolts and screws shall have truss heads or flat heads that are properly countersunk, at exterior and interior surfaces that are normally visible. Concealed fastenings shall be used throughout, unless otherwise approved by the Consultant.

.14 Sheet material for counter tops, tables, shelves and similar forms hall be straight lengths, in one continuous sheet if not over 8 feet long.

.15 Make provisions in the equipment for proper installation of services and connections. Cut and patch only when necessary. The completed installation shall be properly finished without rough edges or exposed openings.

.16 Allow for expansion and contraction of materials.

.17 Obtain samples and confirm sizes of trays, racks, pans and china to determine the exact requirements for openings in equipment.

3.3 CONSTRUCTION

.1 Worktables & Counters

.1 16 ga. stainless steel continuous sheets all welded. Field joints in stainless steel tops; where required due to limitation of sheet sizes, equipment sizes or installation requirements are to be welded, ground smooth and polished to blend with adjacent surfaces

.2 Table or counters up to 60" in length shall have a minimum of 4 legs.

.3 Tables with sinks shall have a marine edge unless otherwise specified.

.4 Worktable and counters with sink, work tops to slope towards sinks. For dish tables 8mm per Front edge level over full length.

.5 Edges shall be as shown and specified in the standard detail.

.6 Kick plates, where specified, shall be of 16 ga. stainless steel and secured to equipment, easily removable.

.2 Backsplash

.1 1" stainless steel fully welded. See Standard Detail

.2 Integral section of table or counter top turned up on a radius to the height specified, then boxed or splayed. Refer to Standard Details.

.3 Enclose and fill all exposed ends and back. Exposed backs at upturns and

.4 Splash backs shall be faced with 16 ga. stainless steel back panel to bottom of splash back. Such panels shall be removable as required for access to mechanical and electrical parts. Secure backsplash to wall by hanging backsplash on galvanized "Z-bar or hanger strip anchored to wall. Seal backs to wall with clear or aluminised silicone.

.3 Legs and Bracing

.1 16 ga. stainless steel wall, 1 5/8" O.D. tubular.

.2 Provide framework for table tops to maintain a height of 36" above finished floor.

.3 Leg spacing maximum 60" apart, 27"mm front to back.

.4 Bullet feet, Component Hardware Model A10-0851, or approved equal. When table has service connections, dowel and secure to floor using Component Hardware Model A10-0854, or approved equal. Secure only one set of feet when bridging a structural expansion joint.

.5 Braces shall be continuously welded to legs, polished with minimum reduction in volume.

.6 Cross brace legs in pairs and longitudinal brace at front, centre or back to suit requirements. All set at 8" above floor.

.7 Legs shall be continuously welded to S.S. saddles of inverted U shape 4"mm wide x 1 ¼" deep x 2.75mm. Flanges angled back or rounded at each end.

.4 Shelving
- .1 16 ga. stainless steel all welded construction.
- .2 Boxed edges on all four (4) sides. Notch corners to fit contour of legs as required for work tables.
- .3 Shelves with sides or backs shall be turned up 2" and set to backs or folded if away from walls.
- .4 Shelves shall be easily removable and in sections capable of being pulled out through a single door opening.
- .5 Over shelves to be boxed with backs set to walls and secured with stainless steel fabricated brackets.
- .6 Provide a removable bottom shelf in any counter or table set on an enclosed base with mechanical and electrical services.
- .7 Removable bottom shelf in counters or tables with sink for access to clean-out valve on trap.

.5 Angle Slides
- .1 16 ga. stainless steel construction
- .2 Slides shall be of 2" x 2" section, length to suit. Leading corners rounded.
- .3 Back stops to be provided to limit travel
- .4 Fixed slides to be fully welded to supports on vertical edge (for fabrication) or secured by no less than four (4) S.S. screws (for millwork).
- .5 Adjustable slides to. mount in slots to ease cleaning and removal.
- .6 Verify tray, pan or basket size to ensure accurate fit.

.6 Sink Bowl - Fabricated
- .1 All of 16 ga. stainless steel integrally welded into table or counter top.
- .2 Interior corners radiused 1 ½" both front and rear, all welded and polished. Slope bottom to drain fitting.
- .3 Undercoat with sound deadening compound when sinks are not exposed.
- .4 Multiple sinks to have 18ga. stainless steel apron to conceal gap between bowls.
- .5 Faucets and drains as specified under "Hardware".

3.4 PREFABRICATED, INSULATED WALK-IN TYPE REFRIGERATED & FROZEN ROOM ASSEMBLIES

.1 Materials
- .1 Stainless steel sheet metal (min. 24 ga): to CSA G1110.6 1968 type 304 with No. 4 finish.
- .2 Galvanized steel sheet metal: commercial grade to ASTM A526-M81 with galvanized zinc coating to ASTM A525-M80, designation Z275.
- .3 Mild steel: cold rolled sheet to SAE 1010 to 1020 suitably prepared for the specified finish.
- .4 Aluminum sheet metal: utility sheet with "stucco" pattern finish unless otherwise indicated.
- .5 Sealant: silicone sealing compound, eg. Dow Corning Silastic 732 RTV, or approved equal, silicone adhesive/sealant.
- .6 Asphaltic paint: to CGSB 1-GP-108c, type 1.
- .7 Insulation shall be foamed-in-place polyurethane injected into the panels to form a rigid wall without the use of wood or metal structural members. Insulation for panels and screeds: to CAN/ULC-S705.1, Class 3, poured type foamed-in-place CFC free, polyurethane (urethane), 4" thick with a minimum rating of R24 and shall be rated as self-extinguishing, fire retardant type.
- .8 Factory fabricate the exterior and interior walls, ceilings and floor panels using steel pressure dies and maintain uniformity.

.2 Construction

.1 Panel sections shall consist of exterior and interior metal pans with die formed flanged edges. Section edges shall have a matching tongue and groove profile to ensure self- alignment and to provide a continuous foam-to-foam airtight contact, when panels are locked into place. Flexible vinyl gaskets may be used in addition to the continuous foam-to-foam airtight contact.

.2 Silicone between all panel joints to provide a clean finished appearance and to form air-tight vapour-proof joints unless panel fabrication includes an integral gasket. No wood framing to be used in wall or ceiling panels.

.3 Panel sections shall be of modular design, assembled with eccentric locking devices, Or approved equal, actuated from the interior of any of the rooms and enabling sections to be erected within 1 ½" of any building room, column and ceiling.

.4 Steel for all panels to be painted shall be Satin coat or approved alternative, 24 ga. thick minimum. Paint shall be baked white enamel in two coats. All exterior panels not exposed to normal view to be 0.792mm core galvanized steel.

.5 Door panels shall be insulated and finished as per exterior and interior panels with a minimum 30" x 78" clear door opening. Ensure that doors will close and seal opening.

.6 In-fitting flush hinged type doors (swing as indicated in item description) to fit door openings, insulated and finished same as panels, complete with 30" high x aluminum chequer plate kick panels on both exterior and interior, as well as soft thermoplastics gaskets with magnetic steel core at top and both sides and adjustable rubber wiper gasket at bottom. Gaskets to be oil, fat, water and ultra violet resistant and to be replaceable.

.7 Supply and install double pane Low E (i.e. argon gas filled) double pane viewing window, heated Vacuum Pressure Release Valves within pre-fabricated insulated wall panels for walk-in refrigerated room assemblies as indicated on drawings and the itemized portion of this specification. Viewing windows to be 20" high x 14" wide and mounted at 48" A.F.F. to the bottom of the viewing window.

.8 Supply and install triple pane Low E (i.e. argon gas filled) double pane viewing window, heated Vacuum Pressure Release Valves within pre-fabricated insulated wall panels for walk-in frozen room assemblies as indicated on drawings and the itemized portion of this specification. Viewing windows to be 20" high x 14" wide and mounted at 48" A.F.F. to the bottom of the viewing window.

.9 Door hinges shall be self-closing type, with stainless steel pin and nylon cam-type bearing, of satin finished aluminum.

.10 Latches to match hinges, for opening door by breaking force of trigger-action door closer and magnetic gasket. Latch to be capable of being locked with padlock and to have safety release handle. Adjustable sliding gasket on the bottom of each door. The magnetic force of the gasket must be sufficient to keep the door closed and airtight.

.11 One trigger-action positive door closer, located on exterior, to assist in positive Closing of door.

.12 Anti-condensation heater cables shall be supplied and installed on all walk-in doors at gasket contact area, in snap-on channel, providing sufficient heat to prevent condensation and frost formation. Heaters across sill shall be protected with removable stainless steel cover plates or angles. Heaters shall be inter-wired at factory, terminating in a junction box located on top of prefabricated insulated refrigerated and frozen room assemblies, ready for connection by electrical trades.

.13 Provide appropriate number of fluorescent fixture to ensure a 70 foot/candle (light intensity) at working level.

.14 Where 48" long double tube fluorescent lights are specified for walk-in type refrigerated and frozen room assemblies provide vapour-proof type fixtures with electronic rapid start low temperature ballasts (-29 C) Double tube 48" long fluorescent fixtures to operate on 120/60/1. Terminate wiring for lights in junction boxes located on top of the prefabricated Insulated refrigerated and frozen walk - in type room assemblies, ready for final connection by electrical trades. Use three way switches if more than one door is specified.

.15 Provide and mount additional light fixtures for rooms with a floor area greater than 80 sq. ft. (7.43 metres square).

.16 Each door panel section shall have on the latch side, approximately 48" above the finished floor, an operating toggle switch and pilot light, inter-wired within the panel to an interior fluorescent vapour proof light fixture complete with light tubes and suspended from ceiling panels.

.17 Provide L.E.D. readout thermometers to provide temperature readings from -40 C to +15C and mount on latch side of door panel approximately 60" from floor. Cover sensing bulb with protective metal cover, same finish as walk-in.

.18 Two-way pressure relief port shall be installed in freezer door panel and refrigerator door panels in rooms operating at +2 C or less. Anti-sweat heater cables in frame of port to prevent intake and exhaust ports from freezing. Vent port to be pre-wired within panel.

.19 Where walk-in rooms are floor less, wall panels are to be fastened to screeds in lieu of floors; 76mm high screeds are to be of similar construction material and insulation to wall and ceiling panels. Screeds are to be installed plumb and level and secured to finished building floor. Where walk-in rooms include an insulated floor, wall panels are to be fastened to floor with eccentric cams. Floors shall include a 4" x 4" x door opening width angle cap of aluminum chequer plate to protect the floor panel at the door opening. Freezer door caps shall add a thermal break.

.20 Removable closure panels shall be installed from lower edge of erected ceiling panels to finished building ceiling and cover strips or angles to extend 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 finish of exposed exterior wall panels. Provide removable ventilation panels in front of each condensing unit.

.21 Supply and installation of 16 ga, stainless steel corner guards 2" x2" x 60" H on all exposed exterior corners.

.22 Openings through walls or ceilings for electrical, plumbing or refrigeration lines must be sealed with an approved sealant.

.23 Ceiling panel supports must be anchored to the structural steel and not to the floor deck above.

.24 Prefabricated walk-in refrigerated and frozen storage rooms covered under this section of the specification shall be fabricated to comply with Canadian Standards Association. The CSA label shall be affixed to the interior door jam.

3.5 MECHANICAL REFRIGERATION SYSTEMS

.1 Supply and installation of all mechanical refrigeration equipment and controls for refrigerators, freezers, blast chillers and freezer and tempering rooms to form a complete and functional system consisting of but not limited to:

.1 automatic water regulator valve (on water cooled condensing units only if specified)

.2 evaporator/cooling coil c/w electric defrost heaters in all freezer evaporator coils
.3 automatic water valve on water-cooled condensing units
.4 room thermostat
.5 thermostatic expansion valve(s)
.6 liquid line sight glass
.7 dehydrator filter/drier
.8 solenoid valve
.9 thermostat
.10 dual pressure control
.11 time clock (for defrost cycle in refrigerators and freezers), time activated and temperature terminated
.12 contractor (where applicable)
.13 fused disconnect switch (where applicable)
.14 service valves

.2 The Contractor shall supply all products, materials and labour necessary to provide a complete operating mechanical refrigeration system capable of meeting the cooling demands of, but not limited to, all refrigerated and frozen storage rooms, designated refrigerated preparation/assembly rooms, cook chill food production systems, blast chilling and freezing systems, tempering rooms and ice builder. Parallel compressor pack(s) and/or compressors shall be located in the mechanical room with the capacity to accomodate all of the evaporator coils located in the refrigerated and frozen storage rooms, preparation or assembly rooms, blast chillers and freezers, tempering rooms as well as any air handlers, the ice builder and the blast chillers. The system shall also include roof top evaporative condenser(s)sized to suit the BTU cooling requirements that meet the specifications of the parallel pack(s) and/or individual compressors.

.3 Each individual mechanical refrigeration system shall be sized by the Foodservice Refrigeration Sub-Contractor to suit the internal space, ambient temperatures and humidity levels of surrounding areas, product type and load, heat infiltration and temperature of incoming product in order to maintain the specified holding temperatures. The Food Service Refrigeration Sub-contractor must confirm all of this information with the owner and/or the Department Representative during the bidding period. Equipment sizes specified are to be used as a guideline only. Should an adjustment in the size of any refrigeration equipment be required, advise the Departmental Representative during the bidding period so that an addendum may be issued.

.4 Design compressor and coil capacity on a 16 to 18 hour day compressor operation in 32.8 C ambient temperature maximum.

.5 Design refrigeration equipment for use with Freon R404 for refrigerators and freezers (high, medium, and low temperature applications). Refrigeration equipment for use with Freon R22 will not be accepted.

.6 All condensing units 3/4 H.P. or greater if specified shall be Semi-Hermetic complete with motor, water cooled condenser, receiver, compressor, suction and discharge valves, oil separator, high/low pressure controls and all other necessary components mounted in a flexible manner on a common base with all service valves and controls readily accessible and easily serviceable.

.7 Evaporator (coil) to be forced convection unit cooler type, suspended from ceiling panels. Forced air discharge to be parallel to ceiling. Air circulation motor, multi-fin with tube type coil and grill to be assembled within protective housing. Expansion valve, with strainer, heat exchanger inlet and outlet service valve connections also to be contained within housing. Construct evaporator entirely of non-corrosive materials. Air circulation motors to be life time sealed and entire unit-cooler assembly readily accessible for cleaning.

.8 Evaporator (coil) shall be equipped with mounting brackets, stainless steel drip pan, drain connection and required controls for a safe and satisfactory operation.

.9 Mechanical refrigeration systems used for both refrigerator and freezer applications shall have an automatic electric system for defrosting including heaters and time control. Defrost to be time initiated and temperature terminated with built in fail-safe control and fan delay switch.

.10 Thermostatic type expansion valves, all metal, moisture proof with gas charged bulb clamped to suction end of evaporator (coil). Freezers with 10 P.S.I. expansion valves.

.11 Equip each prefabricated walk-in refrigerated or frozen storage room and refrigerated preparation/assembly rooms with a room thermostat to control solenoid valve. Mount solenoid valves on liquid lines, close to the cooling unit to control flow of refrigerant.

.12 Remote condensing units, compressors or parallel compressor packs in mechanical rooms shall be mounted on 38 x 38mm (1 1/2" x 1 1/2") angle iron racks, welded, primed and painted with black enamel or on concrete pads as specified.

.13 Mount components for each system, as specified herein, in a neat and orderly arrangement. Identify the system being serviced with a permanent stencilled label as well as a second permanent label identifying the name and address of the service agency responsible for servicing and warranty work. Show dates of installation and end of warranty period.

.14 Compressors
- .1 under 1/2 hp - 120/1/60 service
- .2 1/2 hp to 3/4 hp - 208/1/60 service
- .3 1 hp and over - 208/3/60 service

.15 Provide a contactor for each three (3) phase motor and an ON/OFF switch, rated for the hp served, for each single (1) phase motor.

.16 Mount all disconnect switches in an accessible location and clearly identified as to compressor served. Multiple disconnect switches shall be banked together.

.17 Condensate drain lines from evaporators (coils) shall be installed by the mechanical contractor. The Mechanical Contractor shall supply and install the necessary drain line heater cable from freezer drain lines. Co-ordinate drain pitch to ensure a fall of 25mm in 610mm. Wrap all condensate drain lines with insulated, white PVC covering.

.18 Install a PVC sleeve in the walk-in refrigerator wall where any pipe passes through. The sleeve shall be larger than the penetrating pipe to allow for a "permagum" packing and vapour seal.

.19 All refrigeration piping shall be type "L" copper tubing hard drawn with "silfos" brazed joints, verified free of leaks. Completely dehydrate piping before charging with refrigerant.

.20 Joints at equipment on lines 16mm O.D. and smaller shall be made with flareless compression fittings, Swagelock or Metric "Hy-Seal", or approved equal. Joints on lines larger than 16mm O.D. shall be wrought copper solder joint fitting, with adaptor fittings where screwed connections are necessary.

.21 Installation of piping shall conform to applicable requirements of ANSI code for Pressure Piping, Section on "Refrigeration Piping" and CSA Standard for "Mechanical Refrigeration Code". Refrigerant piping to obtain a pressure drop of less than 23kPa per 50 metres in suction lines and 47Kpa per 50 metres in liquid lines. To increase the velocity and assure proper oil return, install smaller diameter vertical risers on suction lines.

.22 All new refrigerant piping is to be pressure tested with dry nitrogen and properly evacuated before recharging with refrigerant.

.23 All refrigerant piping shall be properly identified as to service and direction of flow.

.24 Valves shall be packless type designed and selected for R404 refrigerant. R22 refrigerant will not be accepted.

.25 Insulate suction lines with 16mm thick Armaflex, 19mm thick on freezer system; or approved equivalent fire retardant pipe covering, installed in strict accordance with the manufacturer's recommendations. Tape liquid and suction lines together.

.26 Testing and evacuation procedure shall conform to ANSI B31.5 and test pressure shall be in accordance with CSA Code.

.27 Evacuation shall be accomplished by the use of a vacuum pump to ensure removal of all moisture and non-condensable gases.

.28 Provide all refrigerant required for charging and placing the system in proper operation Charging shall be done through a new filter dryer and completed by a licensed refrigeration contractor.

3.6 EXHAUST VENTILATORS AND HOODS

.1 The basic requirements of the design, installation and use of exhaust systems components including ventilator(s) and hood(s) with or without dampers, exhaust ducts, air moving devices, fire suppression systems, and auxiliary equipment shall be supply and installed in accordance to the current edition of the NFPA-96 and NFPA-17a, and UCL-S646-98.

.2 Fabricate hoods of 1.25mm stainless steel type 304, No. 4 finish with joints and seams fully welded and liquid tight.

.3 Water wash exhaust ventilator(s) shall extract grease by means of centrifugal motion at high velocity and listed under the ULC category Exhaust Hood for Commercial and Institutional Kitchen Grease Extractor Type.

.4 Provide self-closing dampers if so listed by U.L.C. and approved by authorities having jurisdiction.

.5 Duct collars shall be 1.6 mm stainless steel all welded c/w 25 mm flanged perimeter connection.

.6 Drains from multiple hood sections shall be manifolded to one common connection.

.7 Lights shall be fluorescent recessed vapour type fixtures c/w bulbs.

.8 Stainless steel removable enclosure panels shall be provided from top of ventilators to underside of finished ceilings.

.9 Provide a 1.25mm stainless steel service chase approximately 300X200mm to enclose services from top of service wall to underside of ventilators or hoods.

.10 Provide the required and engineered number of U.L.C. grease extractors for filter type exhaust hoods. Extractors constructed of stainless steel frame with stainless steel interior air baffles and strategic weep holes to allow drainage into grease trough.

.11 Grease trough shall be one piece, at back of hood and below extractors c/w a removable 150 x 150 x 100 mm grease container drawer.

.12 Support and hang ventilators and hoods by means of mild steel threaded rod, secured to structural ceiling member. Utilize turn-buckles to ensure a plumb and level installation.

3.7 FIRE SUPPRESSION SYSTEM

.1 The basic requirements for the design, installation and use of a pre-engineered fire suppression system shall be governed by the current edition of the NFPA-17a, NFPA-96, ULC listed, and acceptable to the local authorities having jurisdiction.

.2 A fire condition shall cause the system to automatically discharge above the hazard areas and extinguish the fire.

.3 On discharge of the system, all fuel and power to cooking equipment shall be shut off automatically by means of a mechanical gas valve for gas equipment and/or a contractor for electrical equipment.

.4 The mechanical gas valve(s) shall be supplied by the hood manufacturer for installation in the gas supply line by the Mechanical Division.

.5 Contactors shall be supplied, installed and wired by the Electrical Division.

.6 Provide mechanical, remote fire pull stations along the path of egress as acceptable to the local authorities having jurisdiction.

.7 System discharge nozzles shall have grease caps.

.8 The fire suppression installer shall supply and install all field piping in accordance with the ULC listing of the fire suppression system. Conceal all piping above the roof of the hood whenever possible. All exposed piping to be stainless steel or chrome plated and/or sleeved.

.9 The system shall be installed to the manufacturer's specifications, by qualified representatives and in strict accordance to all applicable codes.

.10 A Type-K hand held fire extinguisher shall be supplied and installed as required by Code.

3.8 ITEMIZED EQUIPMENT SPECIFICATIONS

.1 The following numbers correspond to those on the Foodservice Equipment Drawings.

.2 Where a manufacturer's name and model number is indicated, the item shall be supplied with all standard components, features and materials whether specifically identified or not, and shall be considered inherent in this specification.

.3 Items identified as custom fabricated shall be constructed of stainless steel unless otherwise specified. Refer to detail drawings at the end of this section for general fabrication methods for all items.

.4 Verify mechanical and electrical services on owner supplied equipment.

.5 Approved alternative manufactures must supply a product that is equal in performance to the specified item.

END OF SECTION 11 40 00