SECTION 105113 - METAL LOCKERS

1.1 PRODUCTS

A. Knocked-Down Corridor Lockers:

1. Doors: steel-sheet panels, vented, thickness as per Manufacturer’s Standards.
2. Hinges: Manufacturer's standard.
3. Door Handle and Latch: Projecting.
4. Locks: Manufacturer’s Standards.
5. Base: Legs with closed front and ends.
6. Tops: Flat (not sloping).
7. Ends: Finished end panels.
8. Single-tier, shared lockers with center dividers.
9. Material: Steel sheet, metallic coated.

B. Locker Benches:

1. Tops: Plastic laminate.
2. Pedestals: Movable, aluminum.

C. Knocked-Down Construction: Assembled at Project site.

END OF SECTION 105113

SECTION 111200 - PARKING CONTROL EQUIPMENT

1.1 QUALITY ASSURANCE

A. Materials and equipment shall conform to the latest issue of referenced industry standards, publications, or regulations referenced in this Section, as applicable.

B. These specifications represent the prevailing technology at the time of design. However, during construction, and because the technology may be rapidly evolving, the Contractor is required to propose an upgrade of the specified systems to the latest technology available, so as to bring the specified items to the prevailing technology at the time of construction.

C. It is the Contractor's responsibility to amend, as deemed necessary, any other systems affected by the upgraded submission so as to allow for the complete and proper functionality of all submitted state-of-the-art systems, equipment and relevant products.

D. The Contractor shall comply with the latest NEOM IT and security standards, guidelines and equipment specifications to ensure complying with the standardization being implemented by NEOM.

E. The contractor shall comply with the following NEOM standards and guidelines:

1. NEOM_SDD_Passive_Network_Technical_Specifications_Document
2. NEOM Physical Security Standard
3. Security Systems Requirements

1.2 DESCRIPTION

A. The following specifications sections are preliminary to communicate the design intent and not to be used for construction/procurement purposes.

B. The provided design is conceptual and shall be developed by the Contractor at the next design stage.

1.3 PRODUCTS

A. Automatic Barrier Gates

1. Operator and controller housed in a weather-tight, tamper-resistant cabinet enclosure with gate arm. Device shall be activated by a signal from the nearest guardhouse.

B. Vehicle Detectors

1. Vehicle Loop Detector System: Self-tuning electronic presence detector with adjustable detection patterns, adjustable sensitivity and frequency settings, and panel indicator light.

C. HVM Hydraulic Bollards

1. Comply with NEOM specifications for Hydraulic bollards.
2. Automatic Rising Bollards Type
3. Rise / fall: 2 seconds, allowing for emergency fast operation.
4. Crash rating: K12 or equivalent.

1.4 FIELD QUALITY CONTROL

A. Testing Agency: Contractor engaged .

END OF SECTION 111200

SECTION 112600 - UNIT KITCHENS

1.1 QUALITY ASSURANCE

A. Mockups.

1.2 PERFORMANCE REQUIREMENTS

1.3 LAMINATE-CLAD WOOD CABINETS

A. Quality Standard: KCMA A161.1

1. KCMA certification.

B. Frameless-Style Base and Wall Cabinets, Plywood or MDF:

1. Exposed End Panels: To match front face of cabinet.
2. Door and Drawer Fronts: Plywood or MDF with bonded high-pressure decorative laminate

C. Frameless-Style Base and Wall Cabinets, Veneer faced Oak:

1. Exposed End Panels: To match front face of cabinet. .
2. Door and Drawer Fronts: Harwood oak veneered with bonded high-pressure decorative laminate

1.4 CABINET ACCESSORIES

A. Locks: On base cabinet doors.

B. LED light fixture.

1.5 COUNTERTOPS

A. Countertop for Undercounter-Mounted Sink: Solid-surfacing material.

B. Countertop and Integral Sink: Solid-surfacing material.

1.6 APPLIANCES

A. Appliance Standards:

1. Refrigerators and Freezers: UL 250 or AHAM ER-1; ENERGY STAR rated.
2. Electric Ranges: UL 858 or AHAM HRF-1.
3. Water-efficient clothes washers.

B. Refrigerator:

1. Built-in, dual-compartment refrigerator/freezer, minimum capacity 0.12 cu. M, unless otherwise directed by the Engineer.

C. Electric Range: Freestanding, 762 mm wide, with one oven and four radiant electric burner elements in ceramic glass cooktop.

D. Clothes Washer: Freestanding type, front-loading washing machine.

1. Front Panel: Manufacturer's standard.

1.7 FABRICATION

A. Accessibility: Standard, accessible countertops.

END OF SECTION 112600

SECTION 114000 - FOODSERVICE EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fabricated equipment.
2. Food waste machines.
3. Cooking equipment.
4. Self-contained refrigeration equipment.
5. Walk-in refrigeration equipment.
6. Powered food-preparation equipment.
7. Warewashing equipment.
8. Serving equipment.
9. Utility distribution systems.

B. Owner-Furnished Equipment: Where indicated, Owner will furnish equipment for installation by Contractor.

C. Related Requirements:

1. Section 233813 "Commercial-Kitchen Hoods" for ventilation hoods.

1.3 COORDINATION

A. Coordinate foodservice equipment layout and installation with other work, including layout and installation of lighting fixtures, HVAC equipment, and fire-suppression system components.

B. Coordinate locations and requirements of utility service connections.

C. Coordinate sizes, locations, and requirements of the following:

1. Overhead equipment supports.
2. Equipment bases.
3. Floor depressions.
4. Insulated floors.
5. Floor areas with positive slopes to drains.
6. Floor sinks and drains serving foodservice equipment.
7. Roof curbs, equipment supports, and penetrations.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site - location TBD.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product. Include the following:

1. Manufacturer's model number.
2. Accessories and components that will be included for Project.
3. Clearance requirements for access and maintenance.
4. Utility service connections for water, drainage, power, and fuel; include roughing-in dimensions.
5. Local water softener to be considered for each equipment as accessories.

B. Shop Drawings: For fabricated equipment. Include plans, elevations, sections, roughing-in dimensions, fabrication details, utility service requirements, and attachments to other work.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification: For each factory-applied color finish required, in manufacturer's standard sizes.

1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: For foodservice facilities.

1. Indicate locations of foodservice equipment and connections to utilities.
2. Key equipment using same designations as indicated on Drawings.
3. Include plans and elevations; clearance requirements for equipment access and maintenance; details of equipment supports; and utility service characteristics.
4. Include details of seismic bracing for equipment.

B. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For foodservice equipment to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. Product Schedule: For each foodservice equipment item, include the following:

1) Designation indicated on Drawings.
2) Manufacturer's name and model number.
3) List of factory-authorized service agencies including addresses and telephone numbers.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of construction contiguous with foodservice equipment by field measurements before fabrication. Indicate measurements on Coordination Drawings.

1.9 WARRANTY

A. Refrigeration Compressor Warranty: Manufacturer agrees to repair or replace compressors that fail in materials or workmanship within specified warranty period.

1. Failure includes, but is not limited to, inability to maintain set temperature.
2. Warranty Period: [Five] <Insert number> years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. NSF Standards: Provide equipment that bears NSF Certification Mark or UL Classification Mark certifying compliance with applicable NSF standards.

B. BISSC Standards: Provide bakery equipment that complies with BISSC/Z50.2.

1. Provide BISSC-certified equipment[**, with certification verified by a third-party agency**].

C. UL Certification: Provide electric and fuel-burning equipment and components that are evaluated by UL for fire, electric shock, and casualty hazards according to applicable safety standards, and that are UL certified for compliance and labeled for intended use.

D. Steam Equipment: Provide steam-generating and direct-steam heating equipment that is fabricated and labeled to comply with 2013 ASME Boiler and Pressure Vessel Code.

E. Regulatory Requirements: Install equipment to comply with the following:

1. ASHRAE 15, "Safety Code for Mechanical Refrigeration."
2. NFPA 54, "National Fuel Gas Code."
3. NFPA 70, "National Electrical Code."
4. NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations."

F. Seismic Restraints: Comply with SMACNA's "Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines," Appendix A, "Seismic Restraint Details," unless otherwise indicated.

2.2 FABRICATED EQUIPMENT

A. Edges and Backsplashes: Provide equipment edges and backsplashes indicated complying with referenced standards, unless otherwise indicated.

B. Apply sound dampening to underside of stainless steel and metal work surfaces, including tops, counters, dish and pots tables with angle or channel frame, drain boards, sinks and similar units. Provide coating with smooth surface and hold coating 25 mm back from open edges for cleaning.

C. Edges and Backsplashes: Provide equipment edges side splash and backsplashes indicated complying with referenced SMACNA standard, unless otherwise indicated.

D. Apply sound dampening to underside of stainless steel and metal work surfaces, including tops, counters, dish and pots tables with angle or channel frame, drain boards, sinks and similar units. Provide coating with smooth surface and hold coating 25 mm back from open edges for cleaning.

E. Stainless Steel Sinks (See kitchen layouts for detail):

1. Description: [**One**] [**Two**] [**Three**] [**Four**]-compartment sink(s). Fabricate units of welded stainless steel, sound deadened.

    a. Bowls: Stainless steel, Type 304, **0.078 inch (1.98 mm)** thick.
    b. Integral Drainboards: Stainless steel, Type 304, **0.078 inch (1.98 mm)** thick.
    c. Body: Stainless steel, Type 304, **0.078 inch (1.98 mm)** thick.

        1) Back Splash: **18 inches (457 mm) or as specified**
        2) Side Splash: **18 inches (457 mm) or as specified**

    d. Legs and Feet: Stainless steel tubing legs (1.75mm thick) with adjustable bullet feet.
    e. Accessories: The following may be supplied if requested in the layout:

        1) Faucets and Spouts.
        2) Prerinse Faucet.
        3) Vacuum breaker.
        4) Lever waste with overflow.
        5) Basket strainer.
        6) Continuous waste.
        7) Scrap trough.
        8) Control bracket for food waste disposer controls.
        9) Scrap block and hole.
        10) Stainless-steel pot rack.

2. Stainless Steel Sheet: ASTM A240/A240M, austenitic stainless steel, type as indicated.
3. Fabrication: Prepare sink for installation of the following equipment items:

    a. Water heater.
    b. Food waste disposer; weld disposer cone or collar into sink.
    c. Undercounter dishwasher.
    d. **Other (refer to layout**).

4. Stainless Steel Finish: **Directional satin finish, ASTM A480/A480M, No. 4**.

F. Stainless Steel Tables (See kitchen layouts for detail):

1. Description: Flat-countertop, Prep, Equipment-stand, Mixer-stand, Dish table.

    a. Tops: Stainless steel, **Type 304, 0.078 inch (1.98 mm)** thick, reinforced and sound deadened.
        1) Back Splash: 203 mm.
        2) Edge: Per supplied specification
    b. Welded Undershelf: Stainless steel, Type 304, 1.75 mm thick.
    c. Crossbracing: Stainless-steel tubing, welded to legs. Thickness 1.75mm Cabinet:

        1) Body: Stainless steel, Type 430, 0.050 inch (1.27 mm) thick.
        2) Doors: Sliding or Hinged, stainless steel, Type 304, 1.5 mm thick.
        3) Drawers: Stainless-steel drawer and faceplate

    d. Sink: Stainless steel, Type 304, 0.078 inch (1.98 mm) thick, welded into tabletop and including the following:

        1) Faucet and Spout.
        2) Vacuum breaker.
        3) Leverwaste with overflow.
        4) Basket strainer.
        5) Tail piece.

e. Legs: Stainless-steel tubing with a thickness of 1.75mm.
f. Feet: Stainless-steel adjustable bullets or Stainless-steel, flanged, adjustable bullets or Casters (depends on layout).
g. Accessories may be supplied if requested in the layout :

h. Revise list below to suit Project. Indicate quantities and locations of accessories on Drawings.

1) Control panel.
2) Control bracket for food waste disposer controls.
3) Aluminum pan rack slides, [**six**] [**three**] slides each.
4) Urn trough.
5) Spice bins.

2. Materials:

a. Stainless Steel Sheet: ASTM A240/A240M, austenitic stainless steel, type as indicated.
b. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B, with minimum G90 (Z275) coating.

3. Fabrication: Prepare table for installation of the following equipment items:

a. Food waste disposer; weld disposer cone or collar into sink.
b. Heat lamp.

4. Stainless Steel Finish: Directional satin finish, ASTM A480/A480M, No. 4

G. Stainless Steel Shelf Units (See kitchen layouts for detail):
1. Description: [Table mounted, single deck] [Table mounted, double deck] [Wall mounted].
2. Stainless Steel Sheet: ASTM A240/A240M, austenitic stainless steel, type as indicated.
3. Stainless Steel Finish: Directional satin finish, ASTM A480/A480M, No. 4.

H. Pot Racks (See kitchen layouts for detail):
1. Description: [Wall mounted] [Ceiling hung] [Corner]. Fabricate units of [stainless steel] [painted, cold-rolled steel].

a. Bars: [Double] or [Single].
b. Hooks: 18 per unit.

2. Materials:

a. Stainless Steel Sheet: ASTM A240/A240M, austenitic stainless steel, Type 304.
b. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B, suitable for exposed applications.

3. Finishes:

a. Stainless Steel: Directional satin finish, No. 4
b. Cold-Rolled Steel: Powder-coat painted finish.

I. Stainless Steel Hand Sinks (See kitchen layouts for detail):
1. Description: Lavatory sink. Fabricate units of stainless steel, Type 304, 1.98 mm thick thick.

a. Operation: Electronic, Knee valve, Foot pedal, Wrist handle or Handle.

b. Faucet and Spout.

c. Accessories: The following may be supplied if requested in the layout:

- Chrome-plated tail piece and P trap, NPS 1-1/2 (DN 40), with **1.1-mm** minimum wall thickness.
- Strainer basket with metal post.
- Liquid soap dispenser, splash or deck mounted.
- Liquid soap and towel dispenser.
- Towel dispenser.
- Tubular wall supports.
- Skirt assembly for support.
- Side splashes.

2. Stainless Steel Sheet: ASTM A240/A240M, austenitic stainless steel, type as indicated.

J. Floor Equipment – Troughs & Water Receptacles (See kitchen layouts for detail):.

1. Description: [**4-inch (102-mm)**] or per specified nominal depth excluding tailpiece.

a. Body: Stainless steel, Type 304, 0.078 inch (1.98 mm) thick.
b. Grate: Stainless steel bar, Type 304 or Fiberglass (per detailed specs).
c. Waste Connection: NPS 3 (DN 80).

2. Materials:

a. Stainless Steel Sheet: ASTM A240/A240M, austenitic stainless steel, type as indicated.
b. Stainless Steel Bars: ASTM A276, austenitic stainless steel, type as indicated.

3. Stainless Steel Finish: Directional satin finish, ASTM A480/A480M, No. 4.

2.3 EXHAUST HOOD FABRICATION

1. General: Fabricate hoods indicated from minimum 1.5-mm thick stainless steel, unless otherwise indicated. Comply with UL 710, NFPA 96 and requirements of authorities having jurisdiction.

a. Refer to Division 15 Sections for duct, fan, and fire-extinguishing system requirements.

2. Grease Removal: Provide UL listed, removable, stainless-steel, baffle-type grease filters with spring-loaded fastening. Provide minimum 2-mm thick, stainless-steel filter frame and removable collection basins or troughs.

3. Light Fixtures: Provide NSF-certified fixtures with lamps, vapor-tight sealed lenses, and wiring in stainless-steel conduit on hood exterior.

4. Exhaust-Duct Collars: Minimum 2-mm thick stainless steel.

2.4 STAINLESS-STEEL FINISHES

1. General:

   a. Remove or blend tool and die marks and stretch lines into finish.
   b. Grind and polish surfaces to produce uniform, directional textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

2. Concealed Surfaces: No. 2B finish (bright, cold-rolled, unpolished finish).

3. Exposed Surfaces: No. 4 finish (bright, directional polish).

4. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

5. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

2.5 SUNDRY EQUIPMENT

1. BAYS OF RUNNERS: stainless steel with angle section welded to framework at 50 mm centers, to take trays as described.
2.
3. POT AND PAN RACKS: 4-tier high, welded 38 mm stainless steel tube with 25 mm square hollow section tubes and cross- rails.
4.
5. COMPRESSOR RACKS: heavy galvanized angles to receive compressors mounted on neoprene insulators.
6.
7. CASTORS: 100 mm diameter nylon or white rubber tired, swivel type with threaded stem fitting, self-lubricating sealed swivel bearing and bushed wheel bearing. Each unit is to have two braked castors.
8.
9. FLOOR MOUNTED, STEAM JACKETTED KETTLE: to have stainless steel bracket or clip mounted on wall to receive chrome- plated hot and cold faucet with double swivel spout of sufficient length to fill kettles.
10.
11. INSETS: 18 gauge stainless steel, fully coved, with covers and size and pattern to suit equipment with which provided.

2.6 WALK-IN REFRIGERATION EQUIPMENT

A. Walk-in Refrigeration Units (See Kitchen Layout):
   1. Description: Cooler, Freezer, or Two-compartment unit, with cooler and freezer compartments.
      a. Floors: provide manufacturer's standard 100mm insulated floor screed or per detail specification.
         1) Standard rooms will be supplied with coving to all vertical and horizontal joints. This consists of screw in aluminum retainer, clip on coving corner retainers, corner cover pieces and coving end pieces.
         2) Floor Screed: Manufacturer's standard insulated floor screed – minimum 292mm height (if no panel requested).
      b. Wall & Ceiling: provide manufacturer's standard 100mm insulated floor screed or per detail specification.
         1) For large units, ceiling panels may require structural support; show overhead supports on Drawings and coordinate requirements with Section 055000 "Metal Fabrications."
         2) Bumper Options: bumpers to be provided on the exposed walls (internally and externally). Plastic Dunnage Batten 50mm wide plastic sections and can

be secured to walls to provide protection against trolleys etc. Height of bumpers: first bumper to be 8'' high. Second bumper to be 30'' high.

c. Doors:
   1) Show width and swing for doors on Drawings.
   2) Hinges: Two per door. Self-closing and spring loaded.
   3) Latch: Edge-mounted, positive-type latch with cylinder lock. Equipped with magnetic gasket.
   4) Hardware: Chrome plated.
   5) Include safety-release handle that opens door from inside when door is locked.
   6) Protection: checkered Kickplates each side of the door. Apply 1/8 inch (3mm) thick x 36 inch (914mm) high, no. 6061-T6 hard alloy aluminum diamond tread plate to all exposed exterior sides and to the door interior and exterior. Seal all joints with gray colour Dow-corning® 795 silicon sealant.
   7) Door Panel: Manufacturer's standard 100-mm thick, insulated door panel assembly with door in width and hand indicated. Size to be based on layout requirements.
   8) Door Accessories:
      a) Vision port.
      b) Pressure relief port.
      c) Threshold: Stainless steel, factory installed.
      d) Anticondensate heater at freezer doors.

d. Vaporproof Lighting Fixtures:
   1) Incandescent fixture with 100-W lamp. Has to be protective globe ceiling mounted (quantity based on room size). Pre-wire to common connecting point, on walk-in roof. No exposed conduit of interior ceiling. Index of protection for IP 55 Class 1. Construction (must be earthed). Type tested to BS 4533. 230 volts/50hz/1ph. 0.5 amps .
   2) Control: Neon pilot light and toggle switch located on exterior of door panel.
      a) Quantity: One per compartment, located on door panel

B. Remote refrigeration system (if required), refrigeration piping between assemblies and other accessories or components are field installed and must be supplied with drawings. Verify, with manufacturers, piping requirements.

a. Refrigeration System (As specified per Walk-In Fridge/Freezer):
   1) Self-contained, mounted on unit, Remote system with preassembled condensing unit and evaporator assemblies.
   2) Exterior Condensing Units: Include winter control, crankcase heater, and enclosed weatherproof housing.
   3) Operating Temperature: Walk in fridges to be +2 to +4 Celsius
      Freezer -18 to -20 Celsius

b. Temperature Monitoring System: Electronic monitoring and remote audible alarm system that warns when temperatures register 10 deg F (6 deg C) above or below set temperature.
   1) Suitable for operation down to -25°C.
c. Closure Panels and Trim: **Include closure panels and trim.**

2. Finishes:
   a. Exposed Exterior Finish: Stainless Steel.

b. Unexposed Exterior Finish: Stainless Steel.
c. Interior Finish: Stainless Steel.
d. Closure Panels and Trim: Matched to exposed exterior finish of panels.
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2.7 REFRIGERATION SYSTEM (Specified In Project)

1. Furnish an enclosed Refrigeration System. The frame, enclosure and panels shall be fabricated of structural steel, rigidly reinforced, fully welded housing will be #16 gauge sheet metal and have a vertical discharge transfer ventilation. Housing will have louvered doors and be painted. Entire welded assembly shall be cleaned and painted with a prime coat, then furnished with a coat of 450° baked enamel epoxy based paint.
   a. Furnish as follows:
      Remote package to consist of a balanced, internally prewired, pre-piped, pressure tested and pressure sealed refrigeration system as shown on drawings, designed to accommodate the requirements of cold storage rooms, base refrigerators, etc.. Evaporator coil assemblies equipped with expansion valves, temperature controls and solenoid valves completely mounted and electrically wired. Scope of work will include all fittings, valves, regulators, tubing, hangers, insulation, refrigerant and devices required for a complete system.
2. AIR COOLED SYSTEM: The system shall be an "U.L. or E.T.L. Listed" package system for outdoor or indoor installation. Pre-wired to main fused disconnect switch and pre-piped for single point connection. Internal pitch-pocket required for all electrical and refrigeration tubing inside the system, for roof top installations. External penetrations for ground-mounted installations. Flush mounted internal electrical panel or external. Rack constructed of 16 gauge (or heavier) formed sheet metal parts or structural steel frame, housing to be power coated finish and constructed to prevent any vibration noises. Condenser to be sized for ambient and allitude. Internal piping must meet ASHRAE standards for pressure drop and velocities. All copper piping must have a plastic bushing where secured to a steel support. Air-cooled condenser will be built within main housing. Condenser to be riffled tubing with lanced fin type and have Gold coating for maximum heat transfer. Receivers must before 100% pump down of each system, no matter of the line length. Each suction line will be insulated back to compressor suction valve. Receiver to be insulated/ heated and controlled by a thermostat if ambient drops below -17C.

   Parallel Systems will have oil management system with compressor floats, oil Seperator and reservoir All coils supplied by factory will be supplied with shipped loose ball valves to be installed by refrigeration contractor. Installing refrigeration contractor must supply ball valves on field fixtures supplied by others.

3. RACK SYSTEM WIRING: Shall be U.L. approved and meet requirements of National Electric Code. Included in panel are individual breakers and fuses for all compressors, all contactors, time clocks, relays and all required components. Also, include label identification in panel for all systems. Panel completely factory pre-wired, with a Main External Disconnect Switch. Each freezer unit shall have its own time clock. All compressors shall be completely factory-installed and wired to common control panel for single field connection. All wiring from compressors to panel shall be through an electrical raceway mounted on rack. All wiring job approved, color coded, with tie wraps from all points to control panel. Unit will have a pre-wired main external disconnect switch on unit.
4. COMPRESSER: shall be single stage, operating within the recommended range of suction and discharge pressure of economical operation and with required capacity. Compressors shall be furnished and installed in accordance with the Schedule shown on drawings and as hereinbefore specified under Item No. 123. All units shall be new and factory assembled, to operate with the refrigerant specified on drawings. Compressors shall be [XXX] semi-hermetic [XXX] discus [XXX] semi-hermetic and discus type, fully accessible as manufactured by copeland or equal and shall be protected against overload, single phasing and locked rotor conditions. The speed shall not exceed 1750 RPM.

Compressor shall be equipped with suction and discharge service valves. All units shall be equipped with high-low pressure control switches having adjustable range and differential. The high pressure cut-out shall be of automatic reset type. Each compressor shall include a liquid line drier, sight glass and suction vibration eliminator. Provide separators (with equalization lines) for all systems. All refrigerant lines shall be extended to one side of the package in a neat and orderly manner as per the drawings. All tubing shall be securely supported and anchored with "Unistrut" clamps and channels. Each clamp shall have a plastic bushing to prevent any steel to copper contact. Ends of lines shall be capped against contamination after the unit is completed. These capped ends are to open only a final connection of the package to fixtures.

Included as part of this system shall be all evaporators (unit cooler as shown on the schedule, as hereinbefore specified under Item No. [XXX], schematic and the plan layout). Evaporators shall be installed in the cold storage rooms, with refrigeration lines, drain lines and drain line heaters provided with a pre-piped, pre-wired expansion valve, thermostat, solenoid valve and switches.

5. INSULATION FOR SUCTION LINES: Thickness in accordance with manufacturer's recommendation, not less than ½" (12mm) for medium temperature coolers plus 34°F (1.11°C) and above, ¾" for low temperature coolers 0°F (-17.78°C). Insulation shall be as manufactured by Armstrong "Armaflex" or as required by code for air plenum ceilings. Fire and smoke rated to meet ASTME84-75.

   Suction lines shall be sized to give minimum pressure drop from evaporator to machine of 2 lbs. for high temperature system and 1 lb. for freezer systems and shall not allow gas velocities less than 750FPM in horizontal runs and 1,500 FPM in vertical risers. Liquid lines shall be sized to give maximum pressure drop of 3 lbs. from receiver to evaporator. Suction lines to be designed for adequate oil return under partially iced operation. Tubing runs shall be graded to prevent trapping of oil.

6. UTILITY PENETRATIONS: Provide in cold storage room walls to accommodate refrigeration and drain lines and dress off with stainless steel escutcheon plates. Field cut holes in blanks and moisture-seal penetrations
7. MISCELLANEOUS: Suspend evaporators with ½" (12mm) diameter nylon hangers, provided by cold storage room manufacturer, extending through ceiling panels. Trap all condensate drains
8. Special instruction:
   a. System rack to consist of the following compressors: (See Rack Manufacturers table)
   b. INSTALLATION: Included all labor, material, equipment, tools, refrigerant, oil and other required accessories for the complete installation of systems as shown and specified with interconnection of all accessories accomplished for ease of servicing. Particular attention to be given to oil return, gas velocities, refrigerant pressure drops and neatness. Placement of all exposed pipes to be approved prior to installation. Spacing of piping supports in accordance with ASHRAE standards and not more than 96" (2438mm). Installation shall be by the manufacturers trained personnel.
   c. Furnish manufacturer's dimensional and schematic drawings, piping and wiring diagrams, list of equipment and materials, certified capacity data and installation details. After installation, furnish an "as built" diagram or refrigeration piping system.
   d. This entire assembly shall be installed by a Licensed Refrigeration Contractor as a Sub-Contract to this section of work. Provide direct factory supervision of start-up and training of operating and maintenance personnel.
   e. TESTING: After installation and before charging, evacuate all piping systems to a vacuum, to ASHRAE standards and hold for 24 hours. After evacuation, charge system with nitrogen and maintain pressure of 150% working pressure for 6 hours. Cap off, install pressure gauge and hold for 24 hours minimum. Re-evacuate, hold for 6 hours, charge and make electronic detector test all joints. Each test must be verified in writing by the Food Service Consultant.

f. WORK BY OTHERS: Control wiring, final wiring of connections, conduit and/or pull boxes to be by Electrical Contractor.
g. Refrigeration hook-up by Refrigeration Contractor.
h. Contractor shall furnish to Owner one (1) booklet containing instructions covering the rack systems, installation of the refrigeration equipment, wiring diagrams, operating and maintenance instructions, and other data pertaining to proper upkeep and operation of the rack systems.
i. WARRANTY: This Kitchen Equipment Contractor shall guarantee, for a period of one (1) year after project has been accepted, all materials, workmanship, all parts and labor on the entire refrigeration package, included in his contract.
j. Freon and driers are to be considered as parts. All defective or replaced parts (other than freon) must be returned to the factory for replacement. Nuisance calls, such as switch's being shut off and lack of maintenance are not to be covered under labor warranty.
k. He shall guarantee all requirements included in his contract and bidding documents; he shall further guarantee that all equipment, materials, and workmanship be free from defects that may arise during the period of guarantee, except that which may be due to misuse. The compressor units are to carry a five (5) year manufacturer's warranty.
l. All equipment in this specification, unless otherwise stated, shall be as manufactured by "Omni Temp Refrigeration", or an approved equal.

2.8 UTILITY DISTRIBUTION SYSTEMS

A. Utility Distribution Systems (See Kitchen Layout)
1. Description: **Overhead**, **Counter**, **Island**, **Tray-slide**, **Steam, or Wall-Mounted** system.

2.9 MISCELLANEOUS MATERIALS

A. Installation Accessories, General: NSF certified for end-use application indicated.

B. Elastomeric Joint Sealant: ASTM C920; silicone. Type S (single component), Grade NS (nonsag), Class 25, Use NT (nontraffic) related to exposure, and Use M, G, A, or O as applicable to joint substrates indicated.

1. Public Health and Safety Requirements:

a. Sealant is certified for compliance with NSF standards for end-use application indicated.
b. Washed and cured sealant complies with the FDA's regulations for use in areas that come in contact with food.

2. Cylindrical Sealant Backing: ASTM C1330, Type C, closed-cell polyethylene, in diameter greater than joint width.

2.10 FINISHES

A. Stainless Steel Finishes:

1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
2. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

a. Run grain of directional finishes with long dimension of each piece.

b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

B. Powder-Coat Finishes: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard, baked-polymer, thermosetting powder finish. Comply with resin manufacturer's written instructions for application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install foodservice equipment level and plumb, according to manufacturer's written instructions.

1. Connect equipment to utilities.
2. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections.

B. Complete equipment assembly where field assembly is required.

1. Provide closed butt and contact joints that do not require a filler.
2. Grind field welds on stainless steel equipment until smooth and polish to match adjacent finish.

C. Install equipment with access and maintenance clearances that comply with manufacturer's written installation instructions and with requirements of authorities having jurisdiction.

D. Install cabinets and similar equipment on bases in a bed of sealant.

E. Install closure-trim strips and similar items requiring fasteners in a bed of sealant.

F. Install joint sealant in joints between equipment and abutting surfaces with continuous joint backing unless otherwise indicated. Produce airtight, watertight, vermin-proof, sanitary joints.

3.2 CLEANING AND PROTECTING

A. After completing installation of equipment, repair damaged finishes.

B. Clean and adjust equipment as required to produce ready-for-use condition.

C. Protect equipment from damage during remainder of the construction period.

3.3 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain foodservice equipment.

END OF SECTION 114000

Refer to Appendix for catalogue sheets.

SECTION 117000 – LAUNDRY EQUIPMENT

PART 1 - GENERAL

RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

SUMMARY

B. This Section includes laundry equipment which includes laundry, house keeping and valet equipment indicated on Drawings and schedules and as per the project requirements.

C. Related Sections include the following:

1. Refer to Division 23 Sections for supply and exhaust fans; exhaust ductwork; service roughing-ins; drain traps; atmospheric vents; valves, pipes, and fittings; fire-extinguishing systems; and other materials required to complete laundry equipment installation.
2. Refer to Division 26 &28 Sections for connections to fire alarm systems, wiring, disconnects, and other electrical materials required to complete laundry equipment installation.

SUBMITTALS

D. Product Data: For each type of laundry equipment indicated. Include manufacturer's model number and accessories and requirements for access and maintenance clearances, water and drainage, power or fuel, and service-connections including roughing-in dimensions.

E. Shop Drawings: For laundry equipment not manufactured as standard production and catalog items by manufacturers. Include plans, elevations, sections, roughing-in dimensions, fabrication details, service requirements, and attachments to other work.

1. Wiring Diagrams: Details of wiring for power, signal, and control systems and differentiating between manufacturer-installed and field-installed wiring.
2. Piping Diagrams: Details of piping systems and differentiating between manufacturer-installed and field-installed piping.

F. Coordination Drawings: For locations of laundry equipment and service utilities. Key equipment with item numbers and descriptions indicated in Contract Documents. Include plans and elevations of equipment, access- and maintenance-clearance requirements, details of concrete or masonry bases and floor depressions, and service-utility characteristics.

G. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for exposed products with color finishes.

H. Product Certificates: Signed by manufacturers of refrigeration systems or their authorized agents certifying that systems furnished comply with requirements and will maintain operating temperatures indicated in the areas or equipment that they will serve.

I. Maintenance Data: Operation, maintenance, and parts data for laundry equipment to include in the maintenance manuals specified in Division 1. Include a product schedule as follows:

1. Product Schedule: For each laundry equipment item, include item number and description indicated in Contract Documents, manufacturer's name and model number, and authorized service agencies' addresses and telephone numbers.
2. Additional Parts and Service: In addition to the warranties and guarantees provided for herein, for all equipment not manufactured in the country in which the project is located, the supply, on consignment, a complete set of standard repair parts.

QUALITY ASSURANCE

J. Installer Qualifications: Engage an experienced installer to perform work of this Section who has specialized in installing laundry equipment, who has completed installations similar in design and extent to that indicated for this Project, and who has a record of successful in-service performance, for a period of at least five years.

K. Manufacturer Qualifications: Engage a firm experienced in manufacturing laundry equipment similar to that indicated for this Project and with a record of successful in-service performance.

L. Product Options: Drawings indicate laundry equipment based on the specific products indicated.

M. Listing and Labeling: Provide electrically operated equipment or components specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

N. Regulatory Requirements: Comply with the following National Fire Protection Association (NFPA) codes:

1. NFPA 54, "National Fuel Gas Code."

2. NFPA 70, "National Electrical Code."

O. ASME Compliance: Fabricate and label steam-generating and closed steam-heating equipment to comply with ASME Boiler and Pressure Vessel Code.

P.

Q. ANSI Standards: Comply with applicable ANSI standards for electric-powered and gas-burning appliances; for piping to compressed-gas cylinders; and for plumbing fittings, including vacuum breakers and air gaps, to prevent siphonage in water piping.

R. All equipment shall be designed and equipped with safety devices meeting Occupational Safety and Health Act (OSHA) requirements, including but not limited to gear guards, belt guards, safety switches, emergency stops, over load protection and interlocks.

S. Seismic Restraints: Provide seismic restraints for laundry equipment.

T. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

U. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings." Review methods and procedures related to laundry equipment including, but not limited to, the following:

1. Review access requirements for equipment delivery.

2. Review equipment storage and security requirements.
3. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
4. Review structural loading limitations.
5. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

DELIVERY, STORAGE, AND HANDLING

V. Deliver laundry equipment as factory-assembled units with protective crating and covering.

W. Store laundry equipment in original protective crating and covering and in a dry location.

PROJECT CONDITIONS

X. Field Measurements: Verify dimensions of laundry equipment installation areas by field measurements before equipment fabrication and indicate measurements on Shop Drawings and Coordination Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

COORDINATION

Y. Coordinate equipment layout and installation with other work, including light fixtures, HVAC equipment, and fire-suppression system components.

Z. Coordinate location and requirements of service-utility connections.

AA. Coordinate size, location, and requirements of concrete bases, positive slopes to drains, floor depressions, and insulated floors. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."

WARRANTY

BB. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

CC. Guarantees and Warranties: In addition to and not in limitation of the standard guarantees and warranties (specific and general) usually accompanying the equipment provided for herein and the guarantees and warranties provided by law, the successful bidder guarantees and warrants the following:

1. The equipment provided is standard new equipment, latest model of regular stock product, with parts regularly included in the type of equipment offered. No part has been substituted or applied contrary to manufacturers standard practice.
2. All equipment is in accordance with the requirements of the specifications provided for herein and upon written notice from owner bids shall promptly, without charge, to the satisfaction of the owner, make such changes, replacement, and corrections as may be required to convert all defects in design, material or workmanship in the equipment which shall appear or occur within the first 12 months of operation.
3. For and during a period of 6 months after completion, Contractor shall make any adjustments or repairs necessary to keep the equipment in satisfactory condition at no cost to the owner. Completion, in this case, to mean when all of the equipment has been installed, adjusted and

turned over to the hotel for operation. The entire project will not be considered complete until all equipment is functioning and adjusted properly. The Contractor warrants and guarantees all equipment against material flaws for a period of (1) one year after owner's acceptance. Such warrants and guarantees include parts and labor.

4. The successful bidder guarantees and warrants that the equipment and work supplied will be in compliance with all local laws, regulations and ordinances, and will obtain any and all licenses, insurance, and permits necessary for the installation thereof and shall maintain all licenses, insurances, special licenses and any other act necessary to keep said equipment in compliance with governmental standards.

PART 2 - PRODUCTS

LAUNDRY EQUIPMENT

All Laundry equipment units shall meet the project general specifications and shall be

subject to Engineer approval.

PART 3 - EXECUTION

EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances, service-utility connections, and other conditions affecting installation and performance of laundry equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Examine roughing-in for piping, mechanical, and electrical systems to verify actual locations of connections before installation.

INSTALLATION, GENERAL

C. Install laundry equipment level and plumb, according to manufacturer's written instructions, original design, and referenced standards.

D. Complete equipment field assembly, where required, using methods indicated.

E. Install equipment with access and maintenance clearances according to manufacturer's written instructions and requirements of authorities having jurisdiction.

F. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections.

G. Install cabinets and similar equipment on concrete or masonry bases in a bed of sealant.

PROTECTING

H. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure laundry equipment is without damage or deterioration at the time of Substantial Completion.

COMMISSIONING

I. Startup Services: Engage factory-authorized service representatives to perform startup services and to demonstrate and train Owner's maintenance personnel as specified below.

1. Coordinate laundry equipment startup with service-utility testing, balancing, and adjustments. Do not operate steam lines before they have been cleaned and sanitized.
2. Test each equipment item for proper operation. Repair or replace equipment that is defective in operation, including units that operate below required capacity or that operate with excessive noise or vibration.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
4. Test motors and rotating equipment for proper rotation and lubricate moving parts according to manufacturer's written instructions.
5. Test water, drain, gas, steam, oil, and liquid-carrying components for leaks. Repair or replace leaking components.
6. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance for each laundry equipment item.
7. Review data in the operation and maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
8. Schedule training with Owner, through Engineer, with at least 7 days' advance notice.

END OF SECTION 117000