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Project Manual | 114000 - Food Service Equipment  
Minnesota Multi-Purpose Stadium  
Minneapolis, Minnesota

CCD 060 Construction Documents  
May 2, 2014



MINNESOTA MULTI-PURPOSE STADIUM  
MINNEAPOLIS, MINNESOTA

SECTION 114000

FOODSERVICE EQUIPMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Foodservice equipment.

1.2 RELATED DIVISIONS / SECTIONS:

- A. Refer to General Conditions, Supplementary Conditions, and applicable provisions of Division 1 for additional instructions.
- B. Refer to Interior Design Divisions for applicable provisions and sections regarding decor finishes, applications, details, and special instructions relating to items specified in this Section. Applicable to Projects with items specified in this Section, with décor finishes and/or construction.
- C. Refer to Mechanical/Plumbing Divisions for applicable provisions and sections regarding mechanical services, including, but not limited to, rough-ins, grease traps, steam traps, drain traps, atmospheric vents, valves, pipes and pipe fittings, ductwork, and other materials necessary to complete final connections to individual items as specified in this Section. Not work of this Section.
- D. Refer to Electrical Divisions for applicable provisions and sections regarding electrical services, including, but not limited to, rough-ins, wiring, conduit, disconnects and other materials necessary to complete final connections to individual items as specified in this Section. Not work of this Section.
- E. Work included in other Divisions - Provision of all wall, floor, and/or ceiling/roof openings, recesses, sleeves, and/or conduits; and equipment pads, and sealing thereof, as necessary for installation of items included in this section. Not work of this Section.
- F. Work included in other Divisions - Disconnection of existing equipment to be relocated and/or reused; and removal of existing equipment which will not be reused, as determined and designated by the Architect in other Divisions. Not work of this Section. (Applicable to Projects with existing equipment.)

1.3 DEFINITIONS:

- A. Furnish - Supply and deliver to Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.

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- B. Install (set in place) - Operations at Project Site including actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, finishing, curing, protecting, cleaning and similar operations; ready for final utility connections by other Divisions as appropriate.
- C. Provide - Furnish and install complete, ready for intended use.
- D. Contractor - Refers to the Kitchen Equipment (Sub) Contractor in this Section. References to any other Contractor or Division, will be specific; such as General Contractor, Plumbing (Sub) Contractor / Division, Electrical (Sub) Contractor / Division, Architect designated, etc.

1.4 LAWS, ORDINANCES, REGULATIONS AND STANDARDS:

- A. Comply with the following:
  - 1. Air Conditioning and Refrigeration Institute (A.R.I.): applicable regulations and references of the latest edition of standards for remote refrigeration system(s), components and installation.
  - 2. American Gas Association (A.G.A.): standards for gas heated equipment, and provide equipment with the A.G.A. seal. Automatic safety pilots to be provided on all equipment, where available. (Canadian Gas Association or alternate testing lab's seals accepted if acceptable to local code jurisdictions.)
  - 3. American National Standards Institute (A.N.S.I.): Z21-Series for gas-burning equipment. Provide labels indicating name of testing agency.
  - 4. American National Standards Institute (A.N.S.I.): B57.1 for compressed gas cylinder connections, and with applicable standards of the Compressed Gas Association for compressed gas piping.
  - 5. American National Standards Institute (A.N.S.I.): A40.4 and A40.6 for water connection air gaps and vacuum breakers.
  - 6. American Society of Heating, Refrigeration and Air Conditioning Engineers (A.S.H.R.A.E.): applicable regulations and references of the latest edition of standards for remote refrigeration system(s), components and installation.
  - 7. American Society of Mechanical Engineers (A.S.M.E.): Boiler Code requirements for steam generating and steam heated equipment, and provide A.S.M.E. inspection stamp and registration with National Board.
  - 8. American Society for Testing and Materials (A.S.T.M.): C1036 for flat glass.
  - 9. American Society for Testing and Materials (A.S.T.M.): C1048 for heat-treated flat glass - Kind HS, Kind FT coated and uncoated glass.
  - 10. American Society for Testing and Materials (A.S.T.M.): F232-03 for pre-rinse spray units, and in compliance with Energy Policy Act of 2005 (EPAct).
  - 11. American Welding Society (A.W.S.): D1.1 structural welding code.
  - 12. Energy Policy Act of 2005 (EPAct 2005): water savings pre-rinse spray valves.
  - 13. National Electric Code (N.E.C.): N.F.P.A. Volume 5 for electrical wiring and devices included with foodservice equipment, A.N.S.I. C2 and C73, and applicable N.E.M.A. and N.E.C.A. standards.

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14. National Electrical Manufacturers Association (N.E.M.A.): LD3 for high-pressure decorative laminates.
15. National Fire Protection Association (N.F.P.A.): applicable sections for exhaust hoods, ventilators, duct and fan materials, hoods fire suppression systems, wheel placement systems, construction and installation; in addition to local codes and standards.
16. National Sanitation Foundation (NSF): latest Standards and Revisions, and as accredited by ANSI, IAS, NELAC, ISO, OSHA and SCC. Provide NSF Seal of Approval on all standard manufactured items included in this Project and listed in any NSF Certified Food Equipment Products Category, and on all items of custom fabricated work included in this Project. (UL Sanitation approval and seal accepted if acceptable to local code jurisdictions.)
17. Sheet Metal and Air Conditioning Contractor's National Association (S.M.A.C.N.A.): latest edition of guidelines for seismic restraint of kitchen equipment, as applicable to project location.
18. Underwriters Laboratories (U.L.): as applicable for electrical components and assemblies. Provide either U.L. labeled products or, where no labeling service is available, "recognized markings" to indicate listing in the U.L. "Recognized Component Index". (Canadian Standards Association or alternate testing lab's seals accepted if acceptable to local code jurisdictions.)
19. UL 300 Standard: for wet chemical fire suppression systems for exhaust hoods/ventilators.
20. American with Disabilities Act (ADA): as applicable to this Project.
21. Refrigeration Service Engineers Society (R.S.E.S.): applicable regulations and references of the latest edition of standards for remote refrigeration system(s), components and installation.
22. All refrigerants used for any purpose is to comply with the 1995 and 2010 requirements of the Montreal Protocol Agreement, and subsequent revisions and amendments. No CFC or HCFC refrigerants will be permitted on this Project.
23. All refrigeration components installation, repairs, and/or associated work on any refrigeration system, is to be performed by a Certified Refrigeration Mechanic thoroughly familiar with this type commercial foodservice installation.
24. ETL and other national and international recognized Testing and Listing Agencies labels and certifications are acceptable in lieu of Listing Agencies indicated in these documents, if acceptable to the local code jurisdictions.
25. All applicable local codes, standards and regulations.
26. All special local codes, standard, and regulations; such as (examples only) California Energy Commissions Regulations, Dade County requirements for walk-in cooler(s) and/or freezer(s).
27. For detention facilities projects (as applicable): applicable Correctional Standards. Verify the level of security and construction required with the Architect, and provide all items in compliance.

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1.5 CONTRACTOR'S QUALIFICATIONS:

- A. In addition to requirements of Related Sections 1.2.A:
  - 1. Five (5) years minimum continuous operation under the same company name and ownership.
  - 2. Financial stability and ability to complete this Project.
  - 3. Comparable size and scope projects completed in the last five (5) years.
  - 4. Manufacturer's authorization to purchase, distribute, and install all items specified.
- B. Any sub-contractor or fabricator employed by Contractor:
  - 1. Is to comply with the same qualifications.
  - 2. Their name, address, and a brief summary of their experience and qualifications is to be submitted with the bid proposal.

1.6 BIDDING AND SUBSTITUTIONS:

- A. Unless otherwise instructed by Division 1 bidding instructions, the Bidder shall provide pricing on primary manufacturer and model specified; in a form giving itemized prices for each item, with separate total prices for delivery and installation. Any and all city, state, occupational and government taxes which are applicable to this project, shall be included and added as a separate charge. All figures shall be included in a grand total package bid proposal. Bids shall be valid for thirty (30) days after bid deadline date, and shall indicate same. Failure to comply with the above may be cause for rejection of the bid.
- B. Unless otherwise noted, substitutions may be submitted for consideration, but must be itemized at the end of the bid proposal.
- C. Substitutions must be approved in writing by the Architect and/or Owner, prior to utilization in this Contract. A copy of the approval must be included with any submittals by Contractor.

1.7 APPROVED SUBSTITUTIONS AND/OR LISTED ALTERNATES:

- A. Substitutions approved as noted in article 1.7, and/or any Listed Alternate manufacturers included in the Itemized Specifications article 3.10, or added by Addendum, may be utilized, in lieu of the primary specified manufacturer with the following conditions:
  - 1. These Contract Documents are designed and engineered using the primary specified manufacturer and model. Contractor assumes total responsibility for any deviations required, due to utilization of a substitution/alternate manufacturer or model; including, but not limited to, fitting alternates into available space, providing directions for required changes, and assuming any associated cost for utility, building, architectural, or engineering changes.

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2. Contractor is responsible for supplying the model, which is as close as possible to the primary specified model in regards to general function, features, options, sizes, accessories, utility requirements, finish, operation, and listing approvals. If it is determined by the Owner or their appointed representative at any time during the construction and installation, and prior to the final acceptance of the Project, that the substitution/alternate model submitted is not equivalent to the primary specified model, the Contractor will assume all associated cost and implications required to replace the model submitted, with the correct model.
3. The bid proposal is to clearly state any substitutions/alternates, which will be utilized including the manufacturer and model number. Also include a data sheet for each substitution/alternate, with any and all deviations between the primary specified manufacturer and the substitution/alternate manufacturer. Cut sheet from manufacturers, will not be acceptable as the data sheet. Complex alternates such as utility distribution systems, exhaust hoods, ventilators, etc. are to include a shop drawing specific to the Project.
4. Inclusion of an alternate manufacturer in Itemized Specifications article 3.10, is not intended to indicate that there is an equal alternate unit to match every primary specified unit. It is the responsibility of the Contractor to insure that the alternate unit submitted matches the primary specified unit; and meets the conditions as stated above.
5. Manufacturers not approved as substitutions, or included as a Listed Alternates will not be permitted.

1.8 DISCREPANCIES:

- A. Where discrepancies are discovered between the drawings and the specifications, regarding quality or quantity, the higher quality or the greater quantity is to be included in the Bid Proposal.
- B. Contractor is responsible for verifying and coordinating all items provided in this Section, with the drawings, specifications, manufacturer's requirements, submittals, actual site conditions, adjacent items, and associated (Sub-) Contractors; to assure that there are no discrepancies or conflicts. This is to include, but not be limited to, quantities, dimensions, clearances required, direction of operation, door swings, utilities, fabrication details and methods, installation requirements, etc.
- C. Contractor to notify the Architect, in writing, of any discrepancies discovered; and await written clarification prior to proceeding with the items or areas in question.

1.9 SUBMITTALS:

- A. Provide two (2) sets of all Submittals for review by the Design Team. After review process, one (1) set will be returned for copying and distribution.

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- B. Contractor to review all submittals for compliance with the Contract Documents, prior to submitting to the Design Team for review.
- C. Contractor is responsible for the accuracy of the information on their submittals. Refer to article 1.9.B for additional Contractor responsibilities, in regards to submittals.
- D. Contractor's use of any Design Team's AutoCAD contract drawings for basis of producing their submittal drawings, is with the following conditions and understanding:
  - 1. Contractor assumes total liability and responsibility for accuracy, and for conformance and verification with the latest Architectural and Engineering drawings, actual field conditions, and all equipment provided.
  - 2. Contractor further assumes responsibility for coordination of their submittals with those of other Contractors and Sub-Contractors, as required.
  - 3. Submittals to have Contractor's title block and information.
- E. Equipment Plan and Rough-In Drawings:
  - 1. Submit 1/4" (1:50) scale drawings. These drawings are to include complete information on the work included in this Contract, with references to equipment as provided by others; and are to provide sufficient information for associated trades, contractors, and/or sub-contractors to complete their division of work associated with food service equipment included in this Contract. They are to be dimensioned; showing locations of ducts, stubs, floor and wall sleeves, for ventilation, plumbing, steam, electrical, refrigeration lines, and concrete base and curb dimensions, as required for equipment so supported, and any additional information pertinent to the installation of this equipment
  - 2. Drawings to also include equipment plan(s) with detailed equipment list, similar to Food Service Equipment Plans included in the Contract Drawings. Item numbers are to be the same as shown in the Contract Documents, and are to include Spare Numbers and associated items as provided by others.
  - 3. In the event rough-ins have been accomplished before award of this contract, Contractor is to examine the existing facility and make adjustments to their equipment to suit building conditions and utilities, where possible. If not possible, so state in a letter, with reasons and an alternate method and pricing for their equipment, to the Architect.
- F. Shop Drawings:
  - 1. Submit shop drawings for items of custom fabrication included in this contract. Shop drawings are to be submitted at 3/4" (1:20) and/or 1-1/2" (1:10) scale and are to show dimensions, materials, details of construction, installation and relation of adjoining work requiring cutting or close fitting. Shop drawings are to also indicate reinforcements, anchorage and related work required for the complete installation of fixtures.
  - 2. Submit shop drawings for any equipment requiring field assembly, including but not limited to, Waldorf cooking assemblies, pulper/extractor assemblies, remote refrigeration systems, walk-in coolers and/or freezers, exhaust hoods/ventilators, fire suppression system, utility distribution systems, pot/utility/ware washing assemblies/machines, and conveyors.

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3. Before proceeding with the fabrication or manufacture of any item, Contractor is responsible for verifying and coordinating all dimensions and details, with site dimensions, conditions, and adjacent equipment.
- G. Product Data Submittal Manuals:
1. Product Data submittals will include a cover sheet and detailed information on every item included in this Section. Detailed information is to include, but not be limited to, item number, description, quantity, model numbers, options and accessories provided, N.E.M.A. plug and receptacle configuration for applicable items, exact utility requirements, manufacturer's cut-sheets, reference to specific shop drawings, and etc. Distribute one additional copy of installation and start-up instructions to the Installer. Every cover sheet and associated detailed submittal is to provide sufficient and complete information for the Design Team to verify that the Contractor understands the Contract requirements, and is providing each item in compliance with the Contract documents. Cover sheets to also include associated items as listed on the Equipment Plan, but provided by others; and are to be noted as "Not In Section 11400 Contract Division".
  2. Reproduction of any part of the Contract Specifications will not be acceptable as part or total of Contractor's Product Data Submittal Manuals. These Manuals are to be produced and assembled entirely by the Contractor, in numerical order according to Item numbers, and bound in 3 ring binders.
- H. Design Team's review of submittal drawings, shop details, product data brochures, and operation and maintenance manuals is for general conformance with the design concept and contract documents. Review markings or comments are not to be construed as relieving Contractor from compliance with the contract documents, or departures there from. Contractor remains responsible for details and accuracy, confirming and correlating all quantities and dimensions, selecting fabrication processes, techniques of assembly, and performing their work in a safe, satisfactory, and professional manner.
- I. Commencement of purchasing or fabrication by the Contractor, of any item(s) included in this Contract, prior to receipt of reviewed Submittals from the Design Team, shall be at the Contractor's own risk; unless specifically instructed to do so in writing by the Owner, including the specific item numbers requested.
- 1.10 OPERATION AND MAINTENANCE DATA MANUALS:
- A. Two (2) bound sets of manuals are to be furnished for items of standard manufacture on/or before the date of the first event to occur of the following: demo/start-up, start-up for intended use by the Owner/Operator, completion of installation of kitchen equipment contract package, or final acceptance of installation by Owner. Manuals are to be in alphabetical order according to manufacturer. Manufacturer's info is to include Tech Services telephone number, email, and web site address, where available.

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- B. Provide a complete list of local service agencies for included manufacturers, complete with address and telephone numbers. Also provide email and web site addresses, where available.
- C. Provide video tapes and/or CD's for maintenance, training, operation, etc, where available from the manufacturer.
- D. Manual shall also include a leak testing report for each and every remote refrigerated system included under this Foodservice Equipment Section, as required in article 2.6.A.6 Refrigeration Equipment of this Section.

1.11 AS-BUILT/ RECORD DOCUMENTS:

- A. Maintain one record set of Foodservice Equipment Plans with any related corrections, revisions, additions, deletions, changes, etc. noted during construction and installation. Provide an "as-built" set in reproducible transparency form and electronic computer disk form.
- B. Provide one (1) final set of Product Data Submittal Manual with any related corrections, revisions, additions, deletions, changes, etc. noted during construction and installation as a specifications record set.
- C. These documents are to be provided at the same time as the O & M Data Manuals.

1.12 SCHEDULE:

- A. Time is of the essence and acceptance constitutes assurance that the Contractor can and will obtain materials, equipment and manpower, to permit installation of the items included in this Section, on schedule. Contractor is to coordinate their work with the progress schedule, as prepared and updated periodically by the General Contractor or Construction Manager.
- B. Anticipated delays, not within the control of the Contractor, are to be noted in a written notification to the Architect, immediately upon the Contractor's realization that delays are imminent.
- C. Failure of manufacturers to meet promised delivery dates will not grant relief to the Contractor for failure to meet schedules; unless the Contractor can establish, in writing, that orders were received by the manufacturer, with reasonable lead times.
- D. Extra charges resulting from special handling or air shipment in order to meet the schedule will be paid by the Contractor, if insufficient time was allowed in placing factory orders.

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1.13 CONTRACTOR COORDINATION RESPONSIBILITY:

- A. Contractor is responsible for coordinating with all applicable Design Team members, General Contractor, other Contractors and/or Sub-Contractors and Trades involved in this Project and associated with any items or work provided under this Section; as required for the successful provision, installation, completion, and functioning of these items and/or work, and the Project in general. This is to include, but not be limited to, exchange of shop drawings, details, and manufacturer's information, supplying templates or actual components to be installed in or on items provided by other Sections, for coordination; and coordinating with and between their own internal staff, sub-contractors, trades, manufacturers, fabricators and installers, for compliance with the Contract Documents.
- B. Contractor responsible for obtaining any documents referenced in this Section and on any associated drawings, which contains information relative to the performance of this Contract; and disseminating and coordinating the pertinent information contained in them, with the appropriate sub-contractors, manufacturers, fabricators, and/or installers.

1.14 PRODUCT HANDLING:

- A. Deliver materials (except bulk materials) in manufacturer's containers, fully identified with manufacturer's name, trade name, type, class, grade, size, color, item number, area, etc.
- B. Contractor is responsible for receiving and warehousing equipment and fixtures, until ready for installation. Store materials, equipment and fixtures in sealed containers, where possible. Store off the ground and under cover, protected from damage.
- C. Contractor to verify and coordinate conditions at the building site, particularly door and/or wall openings, and passages, to assure access for all equipment. Pieces too bulky for existing facilities are to be hoisted or otherwise handled with apparatus as required. All special handling equipment charges will be arranged for and paid for by Contractor.

1.15 PRODUCT PROTECTION:

- A. To the best of their abilities, Contractor is to protect their equipment against theft or damage, until final acceptance by the Owner.
- B. Use all means reasonable to protect the materials of this Section before, during, and after installation; and to protect the associated work and materials of the other trades.
- C. Pre-fabricated walk-in coolers/freezers are not to be used as general storage; and should be locked before leaving the site daily. Damage and theft resulting from failure to secure units will be repaired or replaced at Contractor's expense.

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- D. No architectural walls, ceilings, décor, structural components or any other details may be physically attached to, into, or rest on any walk-in wall, ceiling panel(s), or component thereof. Contractor is responsible for coordinating this requirement with other Contractors.

1.16 WARRANTY:

- A. Unless otherwise noted in Related Divisions / Sections 1.2.A, items furnished are to be fully guaranteed against defects in workmanship, materials, and functionality for one full year from the date of the first event to occur of the following: date of issue of Certificate Of Occupancy (or the equivalent), start-up for intended use by the Owner/Operator, completion of installation of kitchen equipment contract package, or final acceptance of installation by Owner. Should a Temporary Certificate Of Occupancy be issued for partial completion of work, the items furnished within that designated area are to be under warranty from the date of issue of that Certificate. Contractor or their service agent will make necessary repairs and replacements without charge to the Owner, and within a reasonable time.
- B. Additional Refrigeration Warranty: in addition to the one-year warranty requirements as stated above, provide start-up, and parts and labor for the first year; plus additional four-year extended warranty on compressors. Extended warranty is for provision of replacement compressor, determined to be defective by a Certified refrigeration mechanic. However verification of defective compressor, installation of replacement compressor, recharging and repairs of system will be the responsibility of the Owner. This includes all items with built-in or remote refrigeration system.
- C. Periodic routine maintenance, servicing, adjustments, cleaning, etc., as required by the manufacturers included in this Project, are the responsibility of the Owner.
- D. Any and all parts or requirements for manufacturer's warranties to be in effect, whether or not noted in the itemized specifications, are to be provided or complied with by the Contractor. This is to include, but not be limited to, particular parts, accessories, or installation; installation supervision, start-up, and/or follow-up inspections required by factory trained, Certified, and/or authorized personnel. Factory training, Certification, and/or authorization is to be in effect at the time of bidding, installation, start-up, and warranty period of this Project.
- E. Manufacturer's warranties which comply with the requirements of this Warranty article 1.17, are to be provided in lieu of Contractor's own warranties, where available. Copies of the written warranties are to be included in the O & M Manuals.

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PART 2 - PRODUCTS

2.1 EQUIPMENT:

- A. Refer to schedule on Foodservice Drawings and Section 3.10 Itemized Specifications for equipment included in this Section.

2.2 MATERIALS:

A. Metals:

1. Stainless Steel: AISI Type 201 or 302/304, hardest workable temper, and No.4 directional polish. Unless otherwise noted or specified, or required by the manufacturer, 201 may be used wherever 302/304 is listed.
2. Galvanized Steel Sheet: ASTM A526, except ASTM A527 for extensive forming; ASTM A525, G90 zinc coating, chemical treatment.
  - a. Where painted finish is indicated, provide mill phosphatized treatment in lieu of chemical treatment.
3. Steel Sheet: ASTM A569 hot-rolled carbon steel.
4. Galvanized Steel Pipe: ASTM A53 or ASTM A120, welded or seamless, schedule 40, galvanized.
5. Steel Structural Members: Hot rolled or cold formed, carbon steel unless stainless steel is indicated.
  - a. Galvanized Finish (G.I.): ASTM A123 hot-dipped zinc coating, applied after fabrication.
6. Aluminum: ASTM B209/B221 sheet, plate and extrusions (as indicated); alloy, temper and finish as determined by manufacturer/fabricator, except 0.40-mil natural anodized finish on exposed work unless another finish is indicated.

- B. Plastic Laminate: NEMA LD3, Type 2, 0.050" (1.27 mm) thick, except Type 3, 0.042" (1.07 mm) for post-forming smooth (non-textured). Color and texture as selected by Architect/ Interior Designer.

1. Comply with N.S.F. Standard No. 35.
2. Veneered with approved waterproof and heat proof cement. Rubber base adhesives are not acceptable.
3. Applied directly over close grained plywood, such as solid Mahogany or solid Birch, of selected, smooth, sanded stock to ensure a smooth ripple-free laminated surface; or commercial grade furniture particle board, Cortron or equal.
4. Exposed faces and edges are to be faced with 1/16" (1.6 mm) thick material. Corresponding backs are to be covered with approved backing and balancing sheet material.

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- C. Millwork: No unfinished millwork, plywood/particle board or wood framing (including backs, undersides, and all surfaces concealed from view) will be permitted. All unfinished surfaces or openings cut through finished surfaces are to be sealed to be water resistant; with excess plastic laminate material, Cortron (Melamine) material, backing materials, sealers, primers, finish paint, etc., to blend with specified finish materials.
- D. Hardwood Work Surfaces: Laminated edge grained hard maple (*Acer saccharum*), NHLA First Grade with knots, holes and other blemishes culled out, kiln dried at 8 percent or less moisture, waterproof glue, machined, sanded, and finished with N.S.F. approved oil-sealer.
- E. Solid Surface Material (SSM): As indicated, provide DuPont Corian 1/2" (12.7 mm) thick 100% homogeneous filled acrylic material meeting ANSI Z124.6 Type 6; or DuPont Zodiaq 3/4" (19 mm) thick quartz material, unless otherwise specified or selected. Colors and patterns as selected by Architect/Interior Designer. The following guidelines and general requirements apply to DuPont SSM, in addition to granite, marble, or any other solid surface materials specified or selected; except fabricator and installer are to be thoroughly experienced and Certified in commercial foodservice installation of granite, marble, or other solid surface material specified or selected.
1. Comply with N.S.F. Standard No. 51.
  2. Acrylic adhesive is to be used for all joints.
  3. Install directly over 3/4" (19 mm) thick (minimum) substrate of close grained plywood, such as solid Mahogany or solid Birch, of selected, smooth, sanded stock to ensure a smooth ripple-free surface; or commercial grade furniture particle board, Cortron or equal. Additional bracing and support to be provided as required by the SSM manufacturer.
  4. Fabricator to be trained by DuPont factory authorized training personnel and Certified as a Commercial Corian / Zodiaq Fabricator; or equivalent by other SSM manufacturers. If no Commercial Certification program is available from other manufacturer specified or selected, then fabricator is to be Certified as Commercial Corian / Zodiaq Fabricator.
  5. Installer to be trained by DuPont factory authorized training personnel and Certified as a Commercial Corian / Zodiaq Installer; or equivalent by other SSM manufacturers. If no Commercial Certification program is available from other manufacturer specified or selected, then installer is to be Certified as Commercial Corian / Zodiaq Installer.
  6. All fabrication and installation of Corian / Zodiaq, and all components attached to or installed in or through Corian / Zodiaq is to be in compliance with manufacturer's instructions and the DuPont Corian / Zodiaq Commercial Food Service Installation bulletins. Of particular concern are the sections, details, and instructions on the installation of drop-in or built-in hot or cold components. The DuPont Corian / Zodiaq Food Service Installation bulletins requirements are to also apply to any other SSM, in addition to that manufacturer's instructions.
  7. Contractor to verify and coordinate overhead heat lamps and/or food warmers to be installed in accordance with manufacturer's recommendations over solid surface materials, and solid surface materials manufacturer's recommendations.
  8. All surfaces are to be non-porous or cleaned and sealed, in compliance with local health codes; such as with 511 Impregnator by Miracle Sealants for granite.

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F. Insulation:

1. For low temperature applications, such as ice bins, cold pans, or fabricated under counter freezers, use urethane, rigid board foam or foamed-in-place; not less than 2" (50 mm) thick, except that vertical surfaces of cold pans and ice bins may be 1" (25 mm) thick. Insulation to be bonded at joints, to prevent condensation on exterior.
2. For refrigerated applications such as fabricated under counter refrigerators, use urethane rigid board foam or foamed-in-place, or Styrofoam rigid board foam 2" (50 mm) thick, bonded at joints. No fiberglass insulation will be permitted.
3. For heated type applications, such as plate warmers, use block type rock wool, minimum 1" (25 mm) thick; or Marinite I as noted in #4 below.
4. At counters subject to direct or indirect heat from heating or cooking equipment, use 1" (25 mm) thick BNZ Materials, Inc. (303-978-1199) Marinite I, or equal, to insulate between counter and heat source. In addition, provide a 1" (25 mm) minimum air space between the heat source and the insulation.
5. All insulation is to be fully encased or enclosed in 16 gauge (1.6 mm) stainless steel.

G. Joint Materials:

1. Sealants: water proof and mildew resistant silicone sealant, with Shore A hardness of 30, except 45 if subject to traffic, and minimum service temperature range of -60° to +400° F. Sealant to be N.S.F. Standard #51 Listed, and FDA and USDA Approved for use in food zones. Surfaces cleaning and sealants installation to comply with applicable requirements of FDA, USDA, and N.S.F. Standards, and accepted foodservice installation practices.
2. Backer Rod: For 3/8" (9.5 mm) or larger joints, to be polyurethane rod stock, larger than joint width.
3. Gaskets: Solid or hollow (but not cellular) neoprene or polyvinyl chloride; light grey, minimum of 40 Shore A hardness, self-adhesive or prepared for either adhesive application or mechanical anchorage.

H. Paint And Coatings:

1. Provide the types of painting and coating materials which, after drying or curing, are suitable for use in conjunction with foodservice, and which are durable, non-toxic, non-dusting, non-flaking, mildew resistant, and comply with N.S.F. Standards and governing regulations for foodservice.
2. Galvanize Repair Paint: MIL-P-21035.
3. Sound Deadener: N.S.F. listed sound deadening material such as latex sound deadener, for internal surfaces of metal work, and underside of metal counters and tables between work top and underbracing. Verify sound deadening requirements or restrictions with local health authorities.
4. Pretreatment: SSPC-PT2 or PT3, of FS TT-C490.
5. Primer Coating for Metal: FS TT-P-86, type suitable for baking, where indicated.
6. Enamel for Metal: Synthetic type, FA TT-P-491, type suitable for baking, where indicated.

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2.3 FABRICATED PRODUCTS:

- A. Hardware (also refer to article 2.4 Fabrication Of Metal Work in general, and paragraphs O. Doors 1-3 and P. Drawer Assemblies 1-6 specifically, for additional requirements):
1. General: Manufacturer's standard, but not less than ANSI 156.9 Type 2 (Institutional), satin finish stainless steel or dull chrome finish on brass, bronze, or steel.
  2. Hinged Door Hardware: Stainless steel hinged doors to be mounted with heavy duty N.S.F. approved hinges with Component Hardware Group, Model No. P62-1010 pulls, or equal; or full length pulls as per individual itemized specifications and shown on Standard Detail FSD1-24. Catches to be heavy-duty magnetic type, except as otherwise indicated. Millwork cabinet hinged doors to be mounted with Blum 95° CLIP top thick door all metal hinges, nickel plated, with 3 dimensional adjustment, or equal; or as per individual itemized specifications.
  3. Drawer Hardware: Slides to be 200 pounds (90 kilograms) minimum capacity per pair, 201 or 300 series stainless steel, full extension, side-mounting, self-closing type, with stainless steel ball-bearings, and positive stops; Component Hardware Group Series S52, or equal. Pulls to be Component Hardware Group, Model No. P62-1012, or equal; or full length pulls as per individual itemized specifications and shown on Standard Detail FSD1-24.
  4. Sliding Door Hardware: Sliding doors to be mounted on large, quiet ball bearing rollers in 14 gauge (2 mm) stainless steel overhead tracks, and be removable without the use of tools. Bottom of cabinet to have stainless steel guide-pins and not channel tracks for doors.
  5. All hardware to be identified with manufacturer's name and number, so that broken or worn parts may be replaced.
- B. Casters:
1. Type and size as recommended by caster manufacturer, N.S.F. approved for the type and weight of equipment supported; normally 5" (127 mm) diameter heavy-duty, ball-bearing, solid or disc wheel with non-marking grease proof rubber, neoprene or polyurethane tire; unless otherwise specified. Minimum width of tread to be 1-3/16" (30 mm). Minimum capacity per caster to be 250 pound (113.4kg), unless otherwise noted in itemized specifications.
  2. Solid material wheels to be provided with stainless steel rotating wheel guard.
  3. To be sanitary, have sealed wheel and swivel bearings and polished plated finish per N.S.F.
  4. Unless otherwise indicated, equip each item with two (2) swivel-type casters and two (2) fixed casters, with foot brakes on two (2) casters.
  5. Unless item is equipped with another form of all-around protective bumper, provide circular rotating bumper above each caster, 5" (127 mm) diameter tire of light grey synthetic rubber (hollow or closed-cell) on cadmium-plated disc.

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C. Plumbing Fittings, Trim And Accessories:

1. General: Where exposed or semi-exposed, provide bright chrome plated brass or polished stainless steel units. Provide copper or brass where not exposed.
2. Vacuum Breakers: Provide with foodservice equipment as listed in the itemized specifications.
3. Water Outlets: At sinks and at other locations where water is supplied (by manual, automatic or remote control), furnish commercial quality faucets, valves, dispensers or fill devices, of the type and size indicated, and as required to operate as indicated.
4. Waste Fittings: Except as otherwise indicated, furnish 2" (50 mm) remote-lever ball valve type waste valve, and 3-1/2" (89 mm) flat strainer.
5. Also refer to article 2.4.K for additional information.

D. Electrical Materials:

1. General: Provide standard materials, devices and components as recommended by the manufacturer or fabricator, selected and installed in accordance with N.E.M.A. standards and recommendations; and as required for safe and efficient use and operation of the foodservice equipment, without sanitation problems.
2. Components to bear the U.L. label or be approved by the prevailing authority.
3. Custom fabricated refrigerated/freezer units to be provided with vapor tight light receptacles, shatterproof lamps and automatic switches. Wiring to be concealed.
4. Where light fixtures are specified or detailed as part of counters, cases or fixtures; light fixtures with lamps to be furnished and installed. Warm white lamps to be provided, unless otherwise specified. If fluorescent light fixtures are specified, ballasts and tubes to be provided. Shields to be provided for all light fixtures.
5. Convenience and Power Outlets: Make cutouts and install appropriate boxes or outlets in fabricated fixtures, complete with wiring, conduit, outlet and stainless steel cover plate. Outlets and plugs to conform to N.E.M.A. standards. Electrical outlets and devices to be first quality "Specification Grade". GFCI outlets to be furnished where adjacent to sink compartments, as per the National Electrical Code.
6. Plugs and Cords: Where cords and plugs are provided, they are to comply with National Electrical Manufacturer's Association (N.E.M.A.) requirements. Indicate N.E.M.A. configuration for each applicable item.
7. Power Characteristics: Refer to Electrical Divisions specifications for project power characteristics. Also, refer to individual equipment requirements, for loads and ratings.
8. All electrical components (J-boxes, conduit, outlets, switches, cover plates, light fixtures, panels, etc.) built into or on any equipment provided by the KEC, other than standard buy-out factory manufactured equipment, is to be vapor or water tight type. Provide buy-out equipment with vapor or water tight electrical components wherever available.

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2.4 FABRICATION OF METALWORK:

A. General Fabrication Requirements:

1. Remove burrs from sheared edges of metalwork, ease the corners and smooth to eliminate cutting hazard. Bend sheets of metal, at not less than the minimum radius required to avoid grain separation in the metal. Maintain flat, smooth surfaces, without damage to finish.
2. Reinforce metal at locations of hardware, anchorages and accessory attachments wherever metal is less than 14 gauge (2 mm), or requires mortised application. Conceal reinforcements to the greatest extent possible. Weld in place, on concealed faces.
3. Exposed screws or bolt heads, rivets and butt joints made by riveting straps under seams and then filled with solder, will not be accepted. Where fasteners are permitted, provide Phillips head, flat or oval head machine screws. Cap threads with acorn nuts, unless fully concealed in inaccessible construction; and provide nuts and lockwashers unless metal for tapping is at least 12 gauge (2.5 mm). Match fastener head finish with finish of metal fastened.
4. Where components of fabricated metal work are indicated to be galvanized, and involve welding or machining of metal heavier than 16 gauge (1.6 mm), complete the fabrication and provide hot-dip galvanizing of each component, after fabrication, to the greatest extent possible (depending upon available dip-tank sizes). Comply with ASTM A123.
5. Welding And Soldering:
  - a. Materials 18 gauge (1.3 mm), or heavier, to be welded.
  - b. Seams and joints to be shop welded or soldered as the nature of the material may require.
  - c. Welds to be ground smooth and polished to match original finish.
  - d. Where galvanizing has been burned off, the weld is to be cleaned and touched up with high grade aluminum paint.
6. Provide removable panels for access to mechanical and electrical service connections, which are concealed behind or within foodservice equipment, but only where access is not possible and not indicated through other work.
7. Where ends of fixtures, splashbacks, shelves, etc., are open, fill by forming the metal, or welding sections, if necessary, to close entire opening flush to walls or adjoining fixtures.
8. Rolled edges are to be as detailed, with corners bullnosed, ground and polished.
9. Equipment to have 1/2" (12.7 mm) or larger radius coves in horizontal and vertical corners, and intersections, per N.S.F. standards.

B. Metal And Gauges:

1. Except as otherwise indicated, fabricate exposed metalwork of stainless steel; and fabricate the following components from the gauge of metal indicated, and other components from not less than 20 gauge (1 mm) metal:
  - a. Table and counter tops: 14 gauge (2 mm)
  - b. Sinks and drainboards: 14 gauge (2 mm)
  - c. Shelves: 16 gauge (1.6 mm)
  - d. Front drawer and door panels: 18 gauge (1.3 mm) (double-pan type)

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- e. Single pan doors and drawer fronts: 16 gauge (1.6 mm)
  - f. Enclosed base cabinets: 18 gauge (1.3 mm)
  - g. Enclosed wall cabinets: 18 gauge (1.3 mm)
  - h. Exhaust hoods and ventilators: 18 gauge (1.3 mm)
  - i. Pan-type insets and trays: 16 gauge (1.6 mm)
  - j. Removable covers and panels: 18 gauge (1.3 mm)
  - k. Skirts and enclosure panels: 18 gauge (1.3 mm)
  - l. Closure/trim strips over 4" (102 mm) wide: 18 gauge (1.3 mm)
  - m. Hardware reinforcement: 12 gauge (2.5 mm)
  - n. Gusset plates: 10 gauge (3.4 mm)
- C. Work-Surface Fabrication:
- 1. Fabricate metal work surfaces by forming and welding, to provide seamless construction; using welding rods matching sheet metal, grinding and polishing. Where necessary for disassembly, provide waterproof gasketed draw-type joints with concealed bolting.
  - 2. Reinforce work surfaces 30" (762 mm) on center both ways, with galvanized or stainless steel concealed structural members. Reinforce edges, which are not self-reinforced, by formed edges.
- D. Metal Top Construction:
- 1. Metal tops to be one-piece welded construction, including field joints. Secure to a full perimeter galvanized steel channel frame cross-braced not farther than 30" (762 mm) on center. Fasten top with stud bolts or tack welds. If hat sections are used in lieu of channels, close ends.
  - 2. Properly designed draw fastening, trim strip, or commercial joint material to suit requirement is to be used, only if specified.
- E. Structural Framing:
- 1. Except as otherwise indicated, provide framing of minimum 1" (25 mm) pipe-size round pipe or tube members, with mitered and welded joints and gusset plates, ground smooth. Provide 14 gauge (2 mm) stainless steel tube for exposed framing, and galvanized steel pipe for concealed framing.
  - 2. Where indicated, flange rear and end edges up to form splashes integrally with top, with vertical and horizontal corners coved of not less than 1/4" (6 mm) radius, die formed. Turn back splashes 1" (25 mm) to wall across top and ends with rounded edge on break, unless otherwise specified.
  - 3. For die-crimped edges, use inverted "V" 1/2" (13 mm) deep inside and 2" (50 mm) deep on outside, unless otherwise shown. For straight down flanges, make 1-3/4" (45 mm) deep on outside. For bullnose edges, roll down 1-3/4" (45 mm).
  - 4. Edges: die-formed, integral with top. For rounded corners, form to 1" (25 mm) radius, weld, and polish to original finish.

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- F. Field Joints: For any field joint required because of size of fixture; butt-joint, reinforce on underside with angles of same material, bolt together with non-corrosive bolts and nuts, field weld, grind and polish.
- G. Pipe Bases: Construct pipe bases of 1-5/8" (41 mm) diameter 18 gauge (1.3 mm) stainless steel tubing. Fit legs with polished stainless steel sanitary adjustable bullet feet to provide for adjustment of approximately 1-1/2" (37 mm), without exposing threads. Space legs to provide ample support for tops, precluding any possibility of buckling or sagging, and in no case more than 6'-0" (1829 mm) centers.
- H. Legs And Crossrails
1. Equipment legs and crossrails to be 1-5/8" (41 mm), 16 gauge (1.6 mm) stainless steel tubing.
  2. Welds at cross rails to be continuous and ground smooth. Tack welds will not be acceptable.
  3. Bottom of legs to be swedged inward and fitted with a stainless steel bullet-type foot with not less than 2" (50 mm) adjustment.
  4. Free standing legs to be pegged to floor with 1/4" (6 mm) stainless steel rod, or provided with bolt down type flanged feet anchored to the floor; depending on expected severity of use and/or abuse.
  5. Components:
    - a. Stainless Steel Gusset: Stainless steel exterior to fit 1-5/8" (41 mm) tubing, with Allen screw for fastening and adjustment. Not less than 3" (76 mm) diameter at top and 3-3/4" (95mm) long. Outer shell 16 gauge (1.6 mm) stainless steel, reinforced with 12 gauge (2.5 mm) mild steel insert welded interior shell, or approved equal.
    - b. Stainless Steel Low Counter Legs: Stainless steel exterior 5-3/4" (146 mm) minimum, 7" (178 mm) maximum length with stainless steel 3-1/2" (89 mm) square plate with four counter-sunk holes, welded to top for fastening.
    - c. Stainless Steel Adjustable Foot: Stainless steel 1-1/2" (37 mm) diameter tapered at bottom to 1" (25 mm) diameter, fitted with threaded cold rolled rod for minimum 1-1/2" (37 mm) diameter x 3/4" (19 mm) threaded bushing plug welded to legs, or approved equal. Push-in foot not acceptable.
  6. Legs to be fastened to equipment with gussets, as follows:
    - a. Sinks: Reinforced with bushings and set screw.
    - b. Metal Top Tables and Dish Tables: Welded to galvanized steel channels, 14 gauge (2 mm) or heavier, anchored to top with screws through slotted holes.
    - c. Wood Top Tables: Welded to stainless steel channels, 14 gauge (2 mm) or heavier, anchored to top with screws through slotted holes.
- I. Shelves:
1. Construct solid shelves under pipe base tables of 16 gauge (1.6 mm) stainless steel, with 1-1/2" (37 mm) turned down and under edges on exposed sides, and 2" (50 mm) turn up against walls or equipment. Fully weld to pipe legs.

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2. In fixtures with enclosed bases, turn up shelves on back and sides with 1/4" (6 mm) (minimum) radius and feather slightly to ensure a tight fit to enclosure panels.

J. Sinks:

1. Construct sinks of 14 gauge (2 mm) stainless steel with No.4 finish inside and outside.
2. Form back, bottom and front of one piece, with ends and partitions welded into place. Partitions: double thickness, 2" (51 mm) minimum space between walls. Multiple compartments to be continuous on the exterior, without applied facing strips or panels.
3. Cove interior vertical and horizontal corners of each tub not less than 1/4" (6 mm) radius, die formed. Outer ends of drainboards to have roll rim risers not less than 3" (76 mm) high.
4. Drill faucet holes in splashes 2-1/2" (63.5 mm) below top edge. Verify center spacing with faucet specified.
5. Sink insets to be deep drawn of 16 gauge (1.6 mm), or heavier, polished stainless steel. Weld into sink drainboards with 1-1/2" (37 mm) x 1-1/2" (37 mm) x 14 gauge (2 mm) stainless steel angle brackets; securely welded to sinks and galvanized cross angles spot welded to underside of drainboards to form an integral part of the installation.
6. The bottom of each compartment is to be creased such as to ensure complete drainage to waste opening. Slope bottom of sink bowls toward outlet.

K. Drains And Wastes and Faucets:

1. Furnish and install Fisher model 28940, or equal, ball valve type rotary drain assembly with flat strainer and connected overflow assembly, with chrome finish, in die-drawn inset type sinks and bain marie sinks.
2. Other custom fabricated sinks to be furnished with Fisher model 28932, or equal, ball valve type rotary drain assembly, with flat strainer and chrome finish. Waste connection to have 2" (50 mm) external thread size, with 1-1/2" (37 mm) internal thread size.
3. Rotary Handle: Of sufficient length to extend to front edge of sink. No riveting, screws or soldering permitted to fit drains to sinks, with all parts of drains easily removable for servicing and replacement.
4. All faucets furnished with equipment included in this Section to be lead free and comply with N.S.F. Standard #61, Section #9; such as manufactured by Fisher, Chicago, or T&S.
5. Faucets and pre-rinse spray assemblies furnished with equipment included in this Section, are to have a maximum GPM flow rate in compliance with the Energy Policy Act of 2005 (EPAAct) and later updates; or local requirements, whichever is lower. EPAAct / local requirements are to be applicable to all faucets and pre-rinses; except for pre-rinse type assemblies used at glass icing / fill stations, fill hose / faucet assemblies at high water usage cooking equipment such as kettles, tilt fry pans, etc., and fill faucets at high volume / usage sinks such as pot and prep sinks, etc. are to have flow rates of approximately 5 gpm flow minimum.
6. All flex hose type faucet assemblies, such as pre-rinses, kettle fill hoses, etc., to have an inline pressure type back flow preventer in the hose assembly, as required by local codes.
7. All equipment provided by this Contractor, which discharges liquid waste exceeding 140° F (60° C), is to be provided with a cold water drain tempering assembly per local codes.

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L. Workmanship:

1. Best quality in the trade. Field verify dimensions before fabricating; conform all items to dimensions of building; neatly fit around pipes, offsets and other obstructions.
2. Fabricate only in accordance with approved shop drawings, showing pipes, obstructions to be built around, and location of utilities and services.

M. Casework:

1. Enclosure: except as otherwise indicated, provide each unit of casework (base, wall, overhead and free-standing) with a complete-enclosure metal cabinet, including fronts, backs, tops, bottoms, and sides.
2. Bases to be made of 18 gauge (1.3 mm) stainless steel sheets reinforced by forming the metal.
3. Ends, partitions and shelves to be stainless steel.
4. Unexposed backs and structural members may be galvanized, unless otherwise noted.
5. Vertical ends and partitions to be single wall, with a 2" (50 mm) face.
6. Sides and through partitions are flush with bottom rail, welded at intersections.
7. Shelves: Provide adjustable standards for positioning and support of shelves in casework; except bottom shelf of cabinet mounted on legs or as specified. Turn back of shelf units up 2" (50 mm) and hem. Turn other edges down to form open channel. Reinforce shelf units to support 40 pounds per square foot (195 kgs/sq meter) loading, plus 100 percent impact loading.
8. Bottom front rail of bases set on masonry platform to be continuously closed and sealed to platform.

N. Doors:

1. Metal doors to be double-cased stainless steel. Outer pans to be 18 gauge (1.3 mm) stainless steel with corners welded, ground smooth and polished. Inner pan to be 20 gauge (1 mm) stainless steel fitted tightly into outer pan with a sound deadening material such as Celotex or Styrofoam used as a core. The two pans to be tack welded together and joints solder filled. Doors to finish approximately 3/4" (19 mm) thick, and be fitted with flush recessed type stainless steel door pulls; or full length pulls as per individual itemized specifications and shown on Standard Detail FSD1-24.
2. Wood doors to be fabricated as detailed.
3. Hinged doors to be mounted on heavy-duty N.S.F. approved hinges, or as noted on plans or specifications.

O. Drawer Assemblies:

1. Assemblies to consist of removable drawer body mounted in a ball bearing slide assembly with fully enclosed housing.
2. Slide assembly consists of one pair of 200 pound (90 kilograms) capacity stainless steel roller bearing full extension slides, with side and back enclosure panels, front spacer angle, two drawer carrier angles, secured to slides and stainless steel front.

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3. Drawers intended for tools and general non-food products storage are to have 20" x 20" x 6" deep (508 mm x 508 mm x 152 mm), 18 gauge (1.3 mm) minimum stainless steel drawer pans.
  4. Drawers intended to hold food products are to have 12" x 20" x 6" deep (305 mm x 508 mm x 152 mm) stainless steel food pans.
  5. All drawer pans to be easily removable without tools or disassembly of any drawer assembly components.
  6. Drawer fronts are double cased, 3/4" (19 mm) thick, with 18 gauge (1.3 mm) stainless steel welded and polished front pan. Steel back pan is tightly fitted and tack welded. Sound deaden with rigid insulation material.
  7. Provide drawers with replaceable soft neoprene bumpers or for refrigerated drawers, a full perimeter replaceable refrigerator gasket.
- P. Closed Base: Where casework is indicated to be located on a raised-floor base, prepare casework for support without legs, and for anchorage and sealant application, as required for a completely enclosed and concealed base.
- Q. Support from Floor: Equip floor supported mobile units with casters, and equip items indicated as roll-out units, with manufacturer's standard one-directional rollers. Otherwise, and except for closed-base units, provide pipe or tube legs, with adjustable bullet-design feet for floor supported items of fabricated metalwork. Provide 1-1/2" (37 mm) adjustment of feet (concealed threading).
- R. Shop Painting:
1. Clean and prepare metal surfaces to be painted; remove rust and dirt. Apply treatment to zinc coated surfaces, which have not been mill phosphatized. Coat welded and abraded areas of zinc coated surfaces, with galvanize repair paint.
  2. Apply 1.5 mil (dry film thickness) metal primer coating, followed by 2, 1.0 mil (dry film thickness) metal enamel finish coatings.
  3. Bake primer and finish coatings in accordance with paint manufacturer's instructions for a baked enamel finish.
- S. Sound Deadening:
1. Sound deaden underside of metal tops, drainboards, undershelves, cabinet interior shelves, etc., above the underbracing/reinforcing/framing only.
- 2.5 FILTER EXHAUST HOODS AND/OR WATER WASH VENTILATOR FABRICATION:
- A. 18 Gauge (1.3 mm) type 201 or 304 stainless steel external welded construction, in accordance with the latest edition of N.F.P.A. No.96 and International Mechanical Code, including all applicable appendices. Exposed welds to be ground and polished. Exhaust hoods to be U.L. Listed as available for length specified.

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- B. Furnish type of fixture specified. Fixtures to be U.L. listed for cooking equipment exhaust hoods, N.S.F. approved, and with sealed safety lenses.
- C. Furnish welded stainless steel formed duct collars at ceiling or wall duct connections. Verify size and location of duct connections required in this contract, before fabrication.
- D. Pre-piped liquid chemical or water fire suppressant system, as specified; complying with applicable local and N.F.P.A. regulations. Wet chemical fire suppression systems to comply with UL 300 Standards. Water fire suppression systems to comply with U.L. Category Subject 199E. Each pull station is to be clearly identified with a permanent type label, as to which exhaust hood(s) it is for. Each exhaust hood is to have a matching permanent type label, identifying which pull station activates it's fire system.
- E. All cooking equipment below exhaust hoods/ventilators, on casters, are to be provided with positive wheel placement systems for the rear casters, similar to Posi-Set units, in compliance with NFPA-17A 5.6.4 and NFPA-96 12.1.2.3.
- F. Water wash or ultra-violet control panel to be by the same manufacture as the ventilator, with time clock control for automatic operation. Provide stainless steel trim strips for recessed control cabinet applications. Provide stainless steel chase for surface mounted control panel, from top of panel to ceiling, full width and depth of panel.

2.6 REFRIGERATION EQUIPMENT:

- A. General:
  - 1. Furnish either single or multiple compressor units, as specified or recommended by the manufacturer for the sizes and variations between connected evaporator loads as indicated.
  - 2. Furnish units of the capacities indicated, arranged to respond to multiple- evaporator thermostats and defrosting timers. Include coils, receivers, compressors, motors, motor starters, mounting bases, vibration isolation units, fans, dryers, valves, piping, insulation, gauges, winter control equipment and complete automatic control system.
  - 3. Refrigerant: Precharge units with type or types recommended by manufacturer for services indicated, with quick-disconnect type connections only where specified, ready to receive refrigerant piping runs to evaporators and (where remote) to condensers. All refrigerant and associated components to comply with the requirements of the Montreal Protocol Agreement. No CFC or HCFC refrigerants or associated components will be permitted on this Project. HFC refrigerants and components are to be used. Contractor is responsible for coordinating these requirements with manufacturers.

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4. Foodservice equipment items included in this Section, with remote refrigerated systems, are to include interconnecting refrigeration lines, sizing, and insulation between components, as per manufacturer's installation instructions, and as determined by this Contractor's Certified Refrigeration Sub-Contractor; and only after a thorough examination of actual site conditions and obstacles which might affect the routing. Routing should be as direct and short as possible and practical. Refer to additional requirements listed in this Section 11400, 1.5 Laws, Ordinances And Standards.
  5. The minimum outdoor operating ambient temperature for design of units is -10 degrees Fahrenheit (-23 Centigrade), or lower as applicable for extreme low local conditions. The maximum indoor design temperature for operation of compressor units is 95 degrees Fahrenheit (35 Centigrade). The maximum outdoor ambient design temperature is to be determined by Contractor with prevailing conditions at mounting location of compressor, such as sun exposure, limited ventilation, high fences/walls, roof color and materials, local climatic extremes, etc.; but in no case is it to be less than 100 degrees Fahrenheit (37.8 Centigrade).
  6. All refrigeration systems with remote condensing units and job-site installed interconnecting refrigeration lines shall be tested to verify that there are no leaks. Leak testing shall be equal to or better than a professionally recognized 48 hour minimum, pressure holding test. If any leaks are detected, they shall be repaired and another leak test performed; until there are zero leaks detected. A written report of the type test performed and a step-by-step record of the procedure and readings shall be submitted to the KEC for inclusion in the Operations and Maintenance Data Manuals.
- B. Components:
1. Coils for fabricated refrigerators to have vinyl plastic coatings, stainless steel housings; and be installed in such a manner as to be replaceable.
  2. Provide guards for all refrigeration/freezer fans, with maximum 1/2" mesh.
  3. Remote refrigeration system to be complete with thermostatic expansion valves at the evaporator.
  4. Fabricated refrigerated compartments to be fitted with flush dial thermometers, with chrome plated bezels. Thermometers to be adjustable, and shall be calibrated after installation. Thermometers to have an accuracy of  $\pm 2$  degrees Fahrenheit (1 degree Centigrade).
  5. Hardware:
    - a. Refrigerator hardware for fabricated refrigerator compartments to be heavy-duty components.
    - b. Self closing hinges.
    - c. Latches to be magnetic edge mount type, unless specified or detailed otherwise.
  6. Doors and drawers for walk-in coolers/freezers, and reach-in refrigerated compartments, both fabricated and standard, to be fitted with cylinder locking type latches, and provided with master keys.
- C. Cold Pans: Ice pans, refrigerated pans and cabinets to be provided with breaker strips, where adjoining top or cabinet face materials, to prevent transfer of cold.

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- D. All mechanically cooled custom fabricated or standard buy-out refrigerators with openings in the top for cooling pans, and/or all built-in or drop-in mechanically cooled cold pans are to comply with, and be listed by N.S.F. Standard #7. Contractor is to verify that the specified unit complies with this requirement.
- E. Ventilation Of Refrigerated Equipment:
  - 1. Adequate ventilation to be provided for custom fabricated equipment with integral refrigeration condensing units, both built-in and drop-in. If flow through ventilation cannot be provided, provide flow direction partitions and an additional fan capable of cooling the condensing unit.
  - 2. If, in the opinion of the Contractor, additional room ventilation is required to ensure correct operating temperatures of standard buy-out, custom fabricated, or remote refrigeration condensing units, or compressor rack assemblies, they are to so state in a letter to the Architect, for evaluation and decision.

2.7 MISCELLANEOUS MATERIALS AND FABRICATION:

- A. Nameplates: Whenever possible, locate nameplates and labels on manufactured items, in accessible position, but not within customer's normal view. Do not apply name plates or labels on custom fabricated work, except as required for compliance with governing regulations, insurance requirements, or operator performance.
- B. Manufactured Equipment Items: Furnish items as scheduled or herein specified. Verify dimensions, spaces, rough-in and service requirements, and electrical characteristics, before ordering. Provide trim, accessories and miscellaneous items for complete installation.
- C. Insert Pans:
  - 1. General: Cut-outs, openings, drawers, or equipment specified or detailed to hold stainless steel insert pans to be provided with a full complement of pans as follows:
    - a. One (1) stainless steel, 20 gauge (1 mm) minimum, solid insert pan for each space, sized per plans, details, or specifications.
    - b. Where pan sizes are not indicated in plans, details, or specifications, provide one full-size pan for each opening.
    - c. Provide maximum depth pan to suit application and space.
  - 2. Provide 18 gauge (1.3 mm) removable stainless steel adapter bars where applicable.
  - 3. All cut-outs and openings, or equipment specified or detailed to hold stainless steel insert pans, shall be provided with a hinged stainless steel removable night cover.
- D. Tray Slides: Before fabrication of counters with tray slides, verify:
  - 1. Size and shape of tray with Owner/Operator. Edge of tray should not overhang outer support/slider by more than 2" (50 mm). If edge of tray exceeds this dimension, notify Architect, in writing, for evaluation and adjustment, if necessary.
  - 2. Configuration of corners, turns, and shape of tray slides for proper support and safe guidance of trays.

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3. Tray slide to be capable of supporting 200 pounds per linear foot (298 kgs/meter), live load.
- E. Self-leveling dispensers: Verify type, make, dimensions and weight of ware with Owner/Operator; and submit to the dispenser manufacturer, for proper sizing and calibration of dispensers.
- F. Carbon dioxide (CO<sup>2</sup>) equipment: Where equipment requires connection with compressed CO<sup>2</sup> cylinder for operation, provide 2-cylinder manifold and control system (integral with equipment) with proper connectors for Department of Transportation (DOT) approved type cylinders, complete with cylinder safety devices and supports. Applicable to projects with CO<sup>2</sup> equipment included in Contractor's specified equipment.
- G. Reasonable quietness of operation of equipment is a requirement, and Contractor will be required to replace or repair any equipment producing out-of-the-ordinary intolerable noise. This also includes providing and installing bumpers and gaskets for doors and drawers on fabricated and standard manufactured items, and sound insulation where feasible.
- H. Gas pressure regulator: All gas fired equipment included with this Section is to be provided with a gas pressure regulating valve with a built-in vent limiting device. Contractor is responsible for coordinating this requirement with their manufacturers and suppliers.

PART 3 - EXECUTION

3.1 SUPERVISION:

- A. A competent supervisor, representing the Contractor, is to be present at all times during progress of the Contractor's work.
- B. Contractor is responsible for coordinating all general and specific requirements included in Parts 1, 2, and 3 of this Section 11400 general conditions, with their manufacturers, fabricators, and suppliers.

3.2 SITE EXAMINATION:

- A. Verify site conditions under the provisions of the General Conditions, Supplementary Conditions and applicable provisions of Division 1 Sections. Notify the Architect, in writing, of unsatisfactory conditions for proper installation of foodservice equipment.
- B. Verify wall, column, door, window, and ceiling locations and dimensions. Fabrication and installation should not proceed until dimensions and conditions have been verified and coordinated with fabrication details.

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- C. Verify that wall reinforcement or backing has been provided, and is correct for wall supported equipment. Coordinate placement dimensions with wall construction Section.
- D. Verify that ventilation ducts are of the correct characteristics, and in the required locations.
- E. Verify that utilities are available, of the correct characteristics, and in the required locations.

3.3 INSTALLATION:

- A. Sequence installation and erection to ensure correct mechanical and electrical utility connections are achieved.
- B. Install items in accordance with manufacturer's instructions.
- C. Set each item of non-mobile and non-portable equipment securely in place, leveled and adjusted to correct height. Anchor to supporting substrate where indicated, and where required for sustained operation and use without shifting or dislocation. Conceal anchorages wherever possible. Adjust counter tops and other work surfaces to a level tolerance of 1/16" (1.6 mm) (maximum offset, and plus or minus on dimension, and maximum variation in 24" (610 mm) run from level or indicated slope). Provide anchors, supports, bracing, clips, attachments, etc., as required to comply with the local seismic restraint requirements. The Guidelines For Seismic Restraint Of Kitchen Equipment, as prepared for the Sheet Metal Industry Fund of Los Angeles and endorsed by S.M.A.C.N.A., is to be followed.
- D. Complete field assembly joints in the work (joints which cannot be completed in the shop) by welding, bolting-and-gasketing, or similar methods as indicated and specified. Grind welds smooth and restore finish. Set or trim flush, except for "T" gaskets as indicated.
- E. Provide closure plates and strips where required, with joints coordinated with units of equipment.
- F. Provide sealants and gaskets all around each unit to make joints airtight, waterproof, vermin-proof, and sanitary for cleaning purposes.
- G. Joints up to 3/8" (9.5 mm) wide, to be stuffed with backer rod, to shape sealant bead properly, at 1/4" (6 mm) depth.
- H. At internal corner joints, apply sealant or gaskets to form a sanitary cove, of not less than 3/8" (9.5 mm) radius.
- I. Shape exposed surfaces of sealant slightly concave, with edges flush with faces of materials at joint.

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- J. Provide sealant filled or gasketed joints up to 3/8" (9.5 mm) joint width. Wider than 3/8" (9.5 mm), provide matching metal closure strips, with sealant application each side of strips. Anchor gaskets mechanically, or with adhesives to prevent displacement.
- K. Treat enclosed spaces, inaccessible after equipment installation, by covering horizontal surfaces with powdered borax at a rate of 4 ounces per square foot (1.2 kg/m<sup>2</sup>).
- L. Insulate to prevent electrolysis between dissimilar metals.
- M. Cut and drill components for service outlets, fixtures, piping, conduit, and fittings.
- N. Verify and coordinate the mounting heights of all wall shelves and equipment, with equipment located below them, for proper clearances.
- O. Coordinate with the Plumbing and Electrical Divisions, and provide holes in food service equipment for plumbing and electrical service to and through the fixtures, as required. This includes welded sleeves, collars, ferrules, or escutcheons. These services are to be located so that they do not interfere with intended use and/or servicing of the fixture.
- P. All equipment provided by this Section, which requires light bulb(s), are to be provided with heavy-duty, energy efficient, extra long life bulbs with a minimum life expectancy of 5000 hours, and as required by the local Jurisdictions. All light bulbs in and/or above foodservice equipment and/or areas are to be coated or provided with shields in compliance with local health codes.
- Q. All equipment provided by this Section, shall include any and all parts, components, options, accessories, etc. necessary to provide a completely functional item for its intended use under normal conditions; and if appropriate, after the final utility connections are completed by other Divisions. This shall generally apply to equipment such as soda systems, beer systems, remote refrigeration systems, any type remote system or equipment, or ice machines; but shall also apply to any equipment provided by this Section.

3.4 ADJUSTING:

- A. Test and adjust equipment, controls and safety devices to ensure proper working order and conditions.
- B. Repair or replace equipment which is found to be defective in its operation, including units which are below capacity or operating with excessive noise or vibration.

3.5 CLEANING AND RESTORING FINISHES:

- A. After completion of installation, and completion of other major work in foodservice areas, remove protective coverings and clean foodservice equipment, internally and externally.

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- B. Restore exposed and semi-exposed finishes, to remove abrasions and other damages; polish exposed metal surfaces and touch-up painted surfaces. Replace work, which cannot be successfully restored.
- C. Polish glass, plastic, hardware and accessories, fixtures and fittings.
- D. Wash and clean equipment, and leave in a condition ready for the Owner to sanitize and use.

3.6 TESTING, START-UP AND INSTRUCTIONS:

- A. Delay the start-up of equipment until service lines have been tested, balanced, and adjusted for pressure, voltage and similar considerations; and until water and steam lines have been cleaned and treated for sanitation.
- B. Make arrangements for demonstration of foodservice equipment operation and maintenance, in advance with the Owner/Operator.
- C. Demonstrate foodservice equipment, to familiarize the Owner and the Operator on operation and maintenance procedures, including periodic preventative maintenance measures required. Include an explanation of service requirements and simple on-site service procedures, as well as, information concerning the name, address and telephone number of qualified local source of service. The individual(s) performing the demonstration are to be knowledgeable of operating and service aspects of the equipment.
- D. Provide a written report of the demonstration, to the Owner, outlining the equipment demonstrated and malfunctions or deficiencies noted. Indicate individuals present at demonstration.
- E. Final Cleaning: After testing and start-up, clean the foodservice equipment, and leave in a condition ready for the Owner to sanitize and use.
- F. All keys for all locks provided with equipment provided under this Section, are to be gathered up, individually tagged with the equipment they belong to, put into a single box, and handed over to the Owner's authorized representative. A list of the keys and their associated equipment Item numbers is to be provided with the O&M Manuals, along with a copy of the list, signed by the Owner's representative, acknowledging receipt of the keys.

3.7 CLEAR AWAY

- A. Throughout the progress of their work, Contractor is to keep the working area free from debris, and remove rubbish from premises resulting from work being done by them. At the completion of their work, Contractor is to leave the premises in a clean and finished condition.