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UFGS-11 48 00 (January 2008)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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SECTION 11 48 00

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SECTION 11 48 00

CLEANING AND DISPOSAL EQUIPMENT
08/17, CHG 1: 08/18

NOTE: This guide specification covers the requirements for equipment used to clean food service tableware, utensils, pots, pans, spray units, booster heaters, steam exhaust hoods, waste containers and disposers.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

NOTE: Coordinate this section and use in conjunction with the following sections:

11 05 40 COMMON WORK RESULTS FOR FOODSERVICE EQUIPMENT
11 06 40.13 FOOD SERVICE EQUIPMENT SCHEDULE

PART 1 GENERAL

1.1 REFERENCES

NOTE: This paragraph is used to list the

publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH-2097	(2013) Industrial Ventilation: A Manual of Recommended Practice (Metric)
ACGIH-2106	(2007) Industrial Ventilation: A Manual of Recommended Practice for Operation and Maintenance

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)

ASSE 1009	(1990) Performance Requirements for Commercial Food Waste Grinder Units

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA 250	(2020) Enclosures for Electrical Equipment (1000 Volts Maximum)
NEMA ICS 2	(2000; R 2020) Industrial Control and Systems Controllers, Contactors, and Overload Relays Rated 600 V
NEMA ICS 6	(1993; R 2016) Industrial Control and Systems: Enclosures

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2023) National Electrical Code
NFPA 96	(2024) Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

NSF INTERNATIONAL (NSF)

NSF Food Equipment	(2005) NSF Product Listings of Food Equipment and Related Products, Components and Materials
NSF/ANSI 2	(2021) Food Equipment
NSF/ANSI 3	(2021) Commercial Warewashing Equipment
NSF/ANSI 13	(2020) Refuse Processors and Processing Equipment
NSF/ANSI 21	(2022) Thermoplastic Refuse Containers
NSF/ANSI 29	(2021) Detergent and Chemical Feeders for Commercial Spray-Type Dishwashing Machines
NSF/ANSI 59	(2020) Mobile Food Carts
NSF/ANSI 222	(2006e; R 2011) Ozone Generators

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA 1966	(2020) HVAC Duct Construction Standards Metal and Flexible, 4th Edition

U.S. DEPARTMENT OF ENERGY (DOE)

Energy Star	(1992; R 2006) Energy Star Energy Efficiency Labeling System (FEMP)

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA WaterSense	(2006) WaterSense Water Efficiency Labeling System

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910-SUBPART D	Walking - Working Surfaces
29 CFR 1910.144	Safety Color Code for Marking Physical Hazards
29 CFR 1910.145	Specifications for Accident Prevention Signs and Tags
29 CFR 1910.212	Safety Standard for Machinery and Machine Guarding
29 CFR 1910.306	Specific Purpose Equipment and Installations

UNDERWRITERS LABORATORIES (UL)

UL 197	(2010; Reprint Mar 2023) UL Standard for Safety Commercial Electric Cooking Appliances

UL 471 (2010; Reprint Sep 2019) UL Standard for Safety Commercial Refrigerators and Freezers

UL 1598 (2021; Reprint Jun 2021) Luminaires

1.2 GENERAL REQUIREMENTS

****

NOTE: Indicate the configuration and layout for all food preparation equipment, with interior elevations and equipment identified by number. Show "Food Service Equipment Schedule" on the drawings using the same identification numbers[as indicated on the current US Army Quartermaster Center and School equipment schedule]. Ensure that all Contractor built-to-order items, per Food Service Equipment Schedule", are shown and coordinated with the specifications.

Designer must coordinate with other sections, including Section 11 05 40 COMMON WORK RESULTS FOR FOODSERVICE EQUIPMENT and Section 11 06 40.13 FOODSERVICE EQUIPMENT SCHEDULE for general requirements and final connection of equipment.

NOTE: Details of particular equipment and installations are provided on Naval Food Service Division drawings. Use these NAVFSD drawings as a basis for the project details. Contact Supported Command to assist with identification of kitchen equipment necessary to meet mission requirements.

****

Equipment Item	NAVFSSO Dwg. File
1. Soiled Dishtable Assembly	541
2. Soiled Gear Scrapping Assembly	541
3. Utensil Wash Table	553
4. Service Stand	851

Refer to Section 11 05 40 COMMON WORK RESULTS FOR FOODSERVICE EQUIPMENT for general requirements. Also refer to Section 11 06 40.13 FOODSERVICE EQUIPMENT SCHEDULE.

1.3 DESCRIPTION OF WORK

The work includes [furnishing and] [installing] [and modifying existing] food service cleaning and disposal equipment, related accessories, and work. Verify all existing dimensions, contract drawings, product data and all related conditions prior to commencing rough-in work. Include coordination of delivery through existing finished opening and vertical handling limitations within the building. Advise the Contracting Officer

of all discrepancies prior to ordering equipment. Submit Contractor's Field Verification Data prior to the preconstruction meeting.

Provide rough-in and connect utilities to equipment in accord with requirements specified in other sections of this specification and in accord with the physical dimensions, capacities, manufacturer's instructions, and other requirements of the equipment furnished.

1.3.1 Design Requirements

****

NOTE: On the drawings, show:

1. A 1:50 1/4 inch scale floor plan with layout of all food service equipment and Naval Equipment Symbols.

2. Food Service Equipment Schedule laid out in accord with NAVFSSO, current US Army Quartermaster Center and School equipment schedule specified design requirements, including Energy Star labeled model list.

3. Floor, wall, and ceiling penetrations.

4. Raised bases, retainer curbs, or depressions.

5. Recessed, grated floor drains required for equipment.

6. Disconnect switches.

7. Electrical chases and raceways and plumbing chases.

8. Utility connections to building water, sanitary, electrical, and other utility systems. Convenience outlets at point of use for plug-in equipment.

9. All Contractor built-to-order items, per Food Service Equipment Schedule, shown and coordinated with the specifications.

****

Submit detail drawings as stated in Section 11 05 40 COMMON WORK RESULTS FOR FOOD SERVICE EQUIPMENT for food service cleaning and disposal equipment and related accessory equipment. Drawings must be 1:50 1/4 inch scale minimum.

1.4 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity

or criticality, with a "G". Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force, and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor's Field Verification Data; G[, [_____]]

SD-02 Shop Drawings

Detail Drawings; G[, [_____]]

[Custom Fabricated Equipment; G[, [_____]]

] Installation Instructions and Diagrams; G[, [_____]]

Detail drawings, as specified,including insulation and utility requirements.

SD-03 Product Data

Food Service Cleaning and Disposal Equipment; G[, [_____]]

Garbage Disposal; G[, [_____]]

Energy Star Label for Commercial Dishwasher; S

EPA WaterSense Label for Pre-Rinse Spray Valve; S

SD-05 Design Data

Manufacturer's Descriptive and Technical Literature; G[, [_____]]

SD-06 Test Reports

Manufacturer's Test Data; G[, [_____]]

Field Test Reports; G[, [_____]]

SD-07 Certificates

NSF Certification

UL Certification

SD-08 Manufacturer's Instructions

Manufacturer's Instructions; G[, [_____]] for shipping, handling, storage, installation, and start-up.

SD-10 Operation and Maintenance Data

Food Service Cleaning and Disposal Equipment, Data Package 2; G[, [_____]]

Submit in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

SD-11 Closeout Submittals

Manufacturer's Warranty

Contractor's Warranty for Installation

1.5 QUALITY ASSURANCE

Refer to Section 11 05 40 COMMON WORK RESULTS FOR FOOD SERVICE EQUIPMENT.

1.5.1 Pre-Installation Conference

Thirty [_____] days prior to the commencement of work, notify the Contracting Officer that the following items are prepared and ready for review:

a. Shop Drawings, product data and installation instructions

(1) Detail Drawings
[(2) Custom fabricated equipment
Submit custom fabricated equipment drawings after approval of food service equipment drawings.
] (3) Installation Instructions and Diagrams

b. Product Data:

Food service cleaning and disposal equipment

c. Design Data

(1) Manufacturer's descriptive and technical literature
(2) Manufacturer's Test Data

d. Manufacturer's Instructions

Manufacturer's Instructions for shipping, handling, storage, installation, and start-up.

PART 2 PRODUCTS

2.1 MATERIALS

Food service cleaning and disposal equipment must conform to the following;

OSHA standards:

29 CFR 1910.144
29 CFR 1910.145
29 CFR 1910.212
29 CFR 1910.306

NSF standards:

NSF/ANSI 13
NSF/ANSI 2
NSF/ANSI 21
NSF/ANSI 222
NSF/ANSI 3
NSF/ANSI 59
NSF Food Equipment

and other related standards as specified in Section 11 05 40 COMMON WORK RESULTS FOR FOOD SERVICE EQUIPMENT.

Floor areas adjacent to food preparation equipment point of operation, and working surfaces must conform to 29 CFR 1910-SUBPART D.

Preparation equipment materials must conform to the requirements as stated in Section 11 05 40 COMMON WORK RESULTS FOR FOOD SERVICE EQUIPMENT.

2.2 LIST OF EQUIPMENT

****
NOTE: Edit the master "Food Service Equipment Schedule" in Section 11 06 40.13 carefully; retain items of equipment used for the project. The Equipment List is intended to be edited and included in the project Specification. List the information contained on the Equipment List on the Contract Drawings.
****

Submit detailed Food Service Equipment List as specified in Section 11 06 40.13 FOODSERVICE EQUIPMENT SCHEDULE. Include submittal of NSF Certification and UL Certification for individual food preparation equipment components.

2.3 CONSTRUCTION OF FABRICATED EQUIPMENT

Construction and finish of fabricated equipment must conform to the specifications as stated in Section 11 05 40 COMMON WORK RESULTS FOR FOOD SERVICE EQUIPMENT.

2.4 CUSTOM-FABRICATED WORKCOUNTERS, DISHWASHER COUNTERS, AND SINKS

2.5 COUNTER TOPS

Fabricate of 1.8 mm 14 gage stainless steel, with all shop seams and corners welded, ground smooth, and polished.

2.5.1 Counter Edges

Miter and weld corners, grind smooth, and polish.

2.5.2 Work, Landing, and Dump Tables

Roll down counter edges on work, landing, and dump tables 45 mm 1.75 inches at 180 degrees, with corners rounded and bullnosed.

2.5.3 Side and Back Splashes

Turn up counter edges to form side or backsplashes at 90 degrees on a 15 mm 0.625 inch radius with top edge turned back 50 mm 2 inches at 90 degrees with ends closed. Turn up 150 mm 6 inches unless 250 mm 10 inches is required.

2.5.3.1 Soiled Dish Tables, Vegetable, and Pot Sinks

****

NOTE: Designer will indicate dimension and details of the sinks on the drawings. Remove text regarding overflow where not applicable.

****

Turn up counter edges on dishtables and vegetable and pot sinks 75 mm 3 inches at 90 degrees on a 15 mm 0.625 inch radius with top edge rolled 45 mm 1.75 inch at 180 degrees to form a rolled rim. Turn up back edge 250 mm 10 inches at 90 degrees on a 15 mm 0.625 inch radius with top edge turned back 55 mm 2.2 inches at 45 degrees with ends closed.

2.5.3.2 Drain Plug and Overflow Fittings

Provide drain consisting of a 38 mm 1-1/2 inch quick opening brass body valve with side outlet overflow connection with a stainless steel twist lever handle. Provide a removable perforated stainless steel strainer plate of not less than 75 mm 3 inch in diameter. Provide 31 mm 1-1/4 inch diameter chrome-plated brass tubing overflow fittings of not less than 0.91 mm 0.036 inch thickness connected to an overflow head in the back of the sink compartment. Provide overflow head with a removable perforated chrome-plated brass or stainless steel strainer plate of not less than 38 mm 1-1/2 inch diameter. Install overflow head in die-stamped opening 25 mm one inch below counter top.

2.5.3.3 Final Rinse Compartment

Equip the final rinse compartment of the pot washing sink with a booster

heater for sanitizing.

2.5.3.4 Temperature Gauge

Provide temperature gauge with a 75 mm 3 inch diameter face with stainless steel flange.

2.5.3.5 Mounting Valves, Temperature Gauge, and Controls

Mount valves, temperature gauge, and controls in a stainless steel recessed panel, ready for final connections. Provide a perforated stainless steel casing over the temperature bulb.

2.5.3.6 False Bottom

Provide false bottom constructed of 1.9 mm 14 gauge stainless steel, 13 mm 1/2 inch deep pan formed with a perforated top (13 mm1/2 inch holes punched 38 mm 1-1/2 inches on center), with welded corners and finger rings. Fit false bottom with 50 mm 2 inch high by 31 mm 1-1/4 inch outside diameter tubular stainless steel feet with closed ends.

2.5.4 Cutlery and Excess Liquid Sinks

Provide cutlery and excess liquid sinks with a removable standpipe overflow, in lieu of an overflow in the back of the sink. Install the overflow in the corner of the sink compartment. Provide compartments with snug-fitting removable basket strainers. Arrange drain plug with quick-opening valve for operation from the work side of the counter.

[2.5.5 Glass Washing Sinks

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NOTE: Glass-washing sinks are not required in enlisted personnel dining facilities.
****

Construct and provide backsplashes suitable for mounting the glass washing machine. Reinforce back to eliminate vibration and noise.

]2.5.6 Counter Top Support

Provide supports under all edges of counter tops and tables, and at cross members. Stud-weld counter top to supports. Provide either of following types.

2.5.6.1 Channels

25 by 25 mm1 by 1 inch, 2.5 mm thick 12 gage galvanized steel channel. Space cross members 600 mm 30 inches on-center.

2.5.6.2 Angles

38 by 38 by 3 mm1.5 by 1.5 by 0.125 inch galvanized steel angles. Space cross members at 600 mm 2 feet on-center.

2.6 PASS-THROUGH WINDOWS

Except for sill of soiled dish counter, fabricate a mitered window frame of 1.8 mm thick 14 gage stainless steel channel forming a 85 mm 3.5 inch

casing on each side of wall. Return flange 13 mm 0.5 inch, to wall. Weld joints; join only at corners of opening. Seal in accord with Section 07 92 00 JOINT SEALANTS.

2.6.1 Windows for Endless Belt Conveyors

Locate and size opening to allow 13 mm 0.5 inch clearance at each side and below conveyor and 300 mm 12 inch space above conveyor.

2.6.2 Windows for Soiled Dish Counter

Fabricate sill as integral extension of counter. At face of wall opposite counter, turn sill 13 mm 0.5 inch up, then down to form 100 mm 4 inch wide mitered casing.

2.7 CLEANING, DISHWASHING, AND DISPOSAL EQUIPMENT

****

NOTE: Show soiled dishware return service layout and related details on the drawings.

Ozone generators are sometimes required specific zoning or health regulatory agencies for the suppression/elimination of odors generated by food service waste facilities. Delete the statement if not required by project.

****

Commercial warewashing equipment must conform to NSF/ANSI 3. Thermoplastic refuse containers must conform to NSF/ANSI 21.[Ozone generators, used to eliminate odors, must conform to NSF/ANSI 222.]

Provide commercial dishwasher equipment that is Energy Star labeled. Provide data identifying Energy Star label for commercial dishwasher.

2.7.1 Dish Counters

Construct dish counters and sound deaden as specified for in Section 11 05 40 COMMON WORK RESULTS FOR FOOD SERVICE EQUIPMENT. Fit and flange the dish counters into the dishwashing machine with a water-tight joint.

2.7.2 Dish Counter Support Channels

Provide 25 by 100 by 25 mm 1 by 4 by 1 inch, 2.7 mm 12 gauge stainless steel dish counter support channels. Provide channels under dish counter top between each pair of legs and close ends. Provide cross members, on the centerline, between legs. Stud bolt channels to counter top at 150 mm 6 inch on center, maximum.

2.7.3 Dish Counter Components

2.7.3.1 Scupper Drain

Provide scupper drain the full width of dish counter with all corners coved, 150 mm 6 inch wide by 50 mm 2 inch deep, and integrally welded to the soiled/clean dish counter top at the entrance/exit of a rack-type dishwashing machine. Score and slope bottom of the scupper drain to 38 mm 1-1/2 inch brass drain with tailpiece. Provide removable drainer 1.6 mm 16 gauge stainless steel, flush-mounted, pan-formed, perforated top, with

13 mm 1/2 inch holes punched 38 mm 1-1/2 inches on center, and install in the scupper opening on 13 mm 1/2 inch diameter stainless steel legs with closed ends.

2.7.3.2 Prewash Sink

Weld integral 520 by 520 mm 20-1/2 by 20-1/2 inch prewash sink to the dish counter top with the corners rounded on 13 mm 1/2 inch radius. Pitch the sink bottom to 1.6 mm 16 gauge stainless steel[disposer throat flange] [38 mm 1-1/2 inch brass drain]. Provide a 520 mm 20-1/2 inch square 1.6 mm 16 gauge removable rack support/slide assembly, framed with two cross members. Weld two 25 by 3 mm 1 by 1/8 inch stainless steel angle rack guides on top of the frame at 500 mm 20 inch apart with ends flared at 45 degrees.

2.7.3.3 Pre-Rinse Spray Valve

Mount a prerinse spray assembly on the backsplash of the dish counter with vertical tubing, wall bracket, flexible gooseneck hose, and self closing squeeze-type valve and spray.

Provide pre-rinse spray valve that is WaterSense labeled. Provide data identifying EPA WaterSense label for pre-rinse spray valve.

2.7.3.4 Backsplash-Mounted Faucets

****

NOTE: Designer will detail location and type of faucets. Stainless steel will be specified for hospital faucets.

****

Provide combination fitting-type backsplash mounted faucets with concealed supply connections at the back of the sink. Provide fitting with a swinging spout of approximately 200 mm 8 inches in length and inlets with 19 mm 3/4 inch pipe thread. Faucets must have adjustable flanges. Provide valves with indexed metal lever handles and replaceable seats.

2.7.3.5 Hose Bib Faucet

Mount a hose bib faucet on a 2.7 mm 12 gauge stainless steel flange or inverted gusset below top of counter, ground and polished to match counter top.

2.7.3.6 Undershelves

Provide solid type undershelves, constructed as specified for open base shelves.

2.7.3.7 Scraping Trough

Provide a 1.9 mm 14 gauge stainless steel scraping trough in the soiled dish counter with all corners 19 mm 3/4 inch coved, and integrally welded to the dish counter. Provide trough 200 mm 8 inch wide minimum and sloped one percent 1/8 inch per foot or from 100 mm 4 inch depth to integral disposer or prewash sink. Form long sides of trough on a 60 degree angle with a 13 by 13 mm 1/2 by 1/2 inch recessed shoulder at juncture of the dish counter. Provide with removable stainless steel trough covers 197 by 500 mm 7-7/8 by 20 inch, 1.6 mm 16 gauge, pan formed, with perforated

top. Make perforations 13 mm 1/2 inch diameter holes punched 38 mm 1-1/2 inch on center. Provide one trough cover for each 900 mm 36 inch of trough.

Provide and install one inlet fitting at the shallow end of the scraping trough, and intermediate inlet fittings at 1200 mm 48 inch on center. Pipe inlet fittings to a blending valve, vacuum breaker, solenoid valve, and provide a globe valve at each intermediate inlet.

Integral disposer sink must be 450 by 450 by 188 mm 18 by 18 by 7-1/2 inch deep, 1.9 mm 14 gauge stainless steel with all corners coved, welded to dish counter/scraping trough and fitted with a removable silverware-trap. Provide with removable stainless steel flush cover 1.6 mm 16 gauge, 13 mm 1/2 inch pan-formed, and perforated 13 mm 1/2 inch holes punched at 38 mm 1-1/2 inch on center with welded corners. Provide a finger ring for the removal of the cover. Provide 6 mm 1/4 inch diameter stainless steel rod support clips, 50 mm 2 inch long, formed at 45 degree angle with two 19 mm 3/4 inch leg ends[and 6 mm 1/4 inch long threaded ends].

Insert rod-clips through tight clearance holes in sink corners, seal watertight, and secure with stainless steel acorn-nuts or tack-welded at exterior of sink wall. Set support clips for a flush cover position (approximately 13 mm 1/2 inch below top). Interconnect a solenoid valve with the disposer delay-relay control to initiate the blended water flow when the disposer is activated. All inlet fittings must 13 mm 1/2 inch [copper] [stainless steel] tubing from blending valve to inlet fittings. Chrome plate all exposed fittings.

2.7.4 Glass/Cup Rack Overshelf

Provide 1.9 mm 14 gauge stainless steel glass/cup rack overshelf with a 38 mm 1-1/2 inch deep "Vee" trough at free long sides with a 25 mm one inch tight hem at inside of trough. Provide a 13 mm 1/2 inch marine edge at free ends and a 100 mm 4 inch high splash at the wall.

a. Suspend shelf with bottom edge at 450 mm 18 inch above counter top.

b. Provide drain tubes at each end of trough through the backsplash to 19 mm 3/4 inch above top of table.

c. Provide a horizontal rack rest of 41 mm 1-5/8 inch outside diameter stainless steel tubing the full length of the shelf, supported 250 mm 10 inch above the shelf on 31 mm 1-1/4 inch outside diameter stainless steel tubing spaced at 1500 mm 60 inch on center.

2.7.5 Dish/Tray Return Shelf

Provide dish/tray return shelf as indicated on the drawings. Extend shelf through opening in wall to be flush with the wall at the deposit side. Turn down of shelf must be 25 mm one inch at 90 degrees at the front with 19 mm 3/4 inch return at bottom. Turn down rear long side 25 mm one inch at 90 degrees, and integrate with [conveyor slider pan] [dish counter] whenever adjacent.

2.7.5.1 Dish/Tray Return Opening Frame

Provide 1.3 mm 18 gauge stainless steel window shelf with the perimeter flange channel-formed, 25 by 19 mm 1 by 3/4 inch at both sides of the wall. Weld corners of the frame. Install frame with concealed

attachments. Aligned/abut jamb of frame with the end splash of [conveyor slider pan] [dish counter], whenever adjacent.

[2.7.5.2 Overhead Rolling Door

****
NOTE: Designer will delete this paragraph if not used.
****

Provide and install an overhead rolling door into the dish/tray return. Coordinate enclosure and track installation with the splash/jambs, and partition bucks.

]2.8 CONVEYOR

****
NOTE: Indicate arrangement dimensions and details including enclosures, if required, of the conveyors on the drawings. Select either an electrically or gravity powered conveyor.
****

[2.8.1 Conveyor, Electrical

Provide endless belt type conveyor, electrically operated, straight, soiled dish type. Conveyor must be U.L. listed and NSF approved.

2.8.1.1 Trough (Slider Bed)

Provide a one-piece seamless pan constructed conveyor of 1.9 mm 14 gauge stainless steel with integral tracking trough. Pitch integral belt track longitudinally for drainage and equip with a timed/automatic detergent wash. Reinforce horizontal and vertical corners with 2.7 mm 12 gauge stainless steel closed end channels.

Turn up conveyor pan edges 75 mm 3 inch with 19 mm 3/4 inch at 90 degrees to form rolled rim. Pan must be sized to transport standard 356 by 457 mm 14 by 18 inch cafeteria trays. Mount slider pan on "U" shaped supports of 2.7 mm 12 gauge stainless steel, at 1500 mm 60 inch on center. Provide legs as specified for gussets, legs, and feet.

Conveyor drive housing frame must be constructed of 1.9 mm 14 gauge stainless steel. Provide enclosure with a 1.6 mm 16 gauge stainless steel, double insulated pan-formed access door with safety interlock, and set on stainless steel adjustable legs. Provide stainless steel monorail return system with slide rails.

2.8.1.2 Motor

Provide conveyor driven by a totally enclosed gearhead reduction motor of the size scheduled with overload and low voltage protection, with infinitely variable speed from 0.1 to 0.25 meters/second 20 to 50 fpm using solid state controls. The drive must be controlled manually through a water-tight control panel mounted[where indicated][as shown by the manufacturer]. Motor components must be factory prewired in accordance with NFPA 70 using waterproof conduit and NEMA ICS 6 and NEMA 250, Type 4 stainless steel waterproof enclosures. Provide motor with devices to automatically stop the conveyor belt without coasting.

2.8.1.3 Control Panel/Controls

Provide control panel controls with an exposed disconnect switch and overload protection with reset key control for AC motors and replaceable fuse for DC motors. Locate and prewire all components to a terminal strip, such as overload and low voltage protection, motor controller, and control relay, within the control panel. External controls must be 24 volt. Provide a remote on-off switch at each scrap station to manually control the conveyor operation. Also provide an automatic limit switch at the take off end. Provide a conveyor belt with an automatic shutoff jam switch.

2.8.1.4 Belt Washer

Provide belt washer with a stainless steel wash tank with a removable scrap basket, and waste extension. Provide a spray assembly to wash the belt on both sides, factory plumbed through a pump-type detergent injector. The wash assembly must be provided with a mixing valve, water pressure regulator, gauge, vacuum breaker, solenoid valve, and in-line strainers. Provide a timer to regulate the duration of the belt-wash system. The beltwasher must not be operable when the conveyor is stopped. Provide easily accessible stainless steel detergent dispenser cabinet with tank and low level indicator, conforming to NSF/ANSI 29.

2.8.1.5 Drip Pan

Provide a 1.3 mm 18 gauge stainless steel drip pan the full length of the conveyor. Turn up the drip pan on each side, creased for center drainage, and pitch or direct by a conveyor belt to an integral sump and removable strainer at the drain locations.

2.8.1.6 Conveyor Belt

The slat conveyor belt must be overlapping and of nonstaining plastic material. Belt slats must be 250 mm 10 inch wide and snap onto a stainless steel chain without the use of tools. The chain is the driving force. Belts must ride on high density plastic slide rails. Provide stainless steel sprocket hubs and shafts with [ultra-high density plastic] [stainless steel] teeth. Hinge 1.3 mm 18 gauge stainless steel enclosure panels to the slider pan, and the conveyor under-bracing assembly by means of concealed hinges at the top and screw fasteners or magnetic catch at the bottom.

2.8.1.7 Curve Guide

Where the conveyor negotiates a curve, equip with an antifriction device to reduce friction and wear. Apply lubrication, if necessary, to the curve by means of a remote electrical pump.

][2.8.2 Conveyor, Gravity Flow Type

Provide conveyor with [ultra high density plastic] [stainless steel] roller, gravity operated, soiled dish type, to transport standard 356 by 457 mm 14 by 18 inch cafeteria trays, constructed in accordance with NSF/ANSI 2, size and configuration as indicated on drawings.

2.8.2.1 Conveyor Trough (Pan)

Provide one-piece conveyor trough, seamless, constructed of 1.9 mm 14 gauge stainless steel with integral soiled landing table, with depressed trough to accept roller sections, and pan pitched to soiled dishtable where indicated.

]2.8.3 Gussets

Provide stainless steel gussets, fully enclosed, a minimum of 75 mm 3 inch in diameter at the top, reinforced with a bushing, continuously welded to channel or angle.

2.8.4 Legs

Provide 1.6 mm 16 gauge, 41 mm 1-5/8 inch outside diameter stainless steel tubing legs, continuously welded to gussets, channel, or angle as specified.

2.8.5 Feet

Provide sanitary, die-stamped stainless steel bullet-shaped, fully enclosed feet which provide for a 25 mm one inch adjustment without threads being exposed. Finish off the bottom of the legs with the stem overlapped to provide a sanitary closed fitting. Feet for free-standing fixtures requiring utility connections must be as above except with a flanged plate at the bottom which is anchored to the floor with noncorrosive bolts.

2.9 ROLLER ASSEMBLIES

Provide[PVC plastic][stainless steel] tubing style roller sections, with stainless steel ball bearings. Mount rollers to stainless steel hex shafts, set in 2.7 mm 12 gauge stainless steel side rails formed to maintain trays in proper alignment. Fit each section end of frame with stainless steel plate notched for easy removal. Mount roller section in trough to allow for free movement of trays without drag. Provide curved sections with 1.9 mm 14 gauge side rails with two rollers per shaft to negotiate corner turn.

[2.10 CONDENSATE HOODS AND EXHAUSTS

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NOTE: Not all commercial warewashing equipment require condensate exhaust hoods, (i.e."Flight Type" dish machines). Coordinate this item with the project design requirements and the Contracting Officer.

****

****

NOTE: Indicate type, size, shape, and detail of hoods/ducts, and the required standard cubic meters per second (cubic feet per minute), meters per second (feet per minute) (velocity), static pressure, and duct collar size for exhaust/make-up air on the drawings.

****

****

NOTE: Size exhaust and supply fans and exhaust and supply ducts in accord with hood manufacturer's recommendations, to ensure proper balancing for a satisfactory exhaust system. Provide a separate and self-supporting system for each hood. Air changes in the utensil washroom must be 5 changes per hour for general room exhaust and 30 changes per hour when all systems are operating.

****

****

NOTE: Delete types not used in project.

****

Provide hood and duct work systems conforming to ACGIH-2097 ACGIH-2106, SMACNA 1966, and NFPA 96. Unless otherwise specified, secure ducts and hoods to building so as to be level and free from vibrations under all conditions of operation. Supply and install exhaust fans for food service equipment and exhaust hoods as specified in Section [_____].

[2.10.1 Hood Over Utensil-Washing Sink, Type 5

****

NOTE: If Type 5 hood is not used, insert salient requirements regarding shape, mounting, and duct connection.

****

Provide a 1980 by 1065 by 450 mm 78 by 42 by 18 inch high hood. Provide condensate collecting gutter and drain to sink drainboard or floor drain. Slope top of hood 150 mm 6 inches down toward front of hood starting 300 mm 12 inches in from back edge. Mount to wall with anchors provided by manufacturer and hang from ceiling with 16 mm 0.625 inch stainless steel rods. Provide an opening in top of hood for exhaust duct. Center opening in top of hood from left to right and front to back. Provide a 50 mm 2 inch high stainless steel duct collar, welded to hood top. Mount at height indicated. Provide controls for fans.

][2.10.2 Hood Over Utensil-Washing Machine, Type 6

****

NOTE: If Type 6 hood is not used, insert salient requirements regarding shape, mounting, and duct connection.

****

Provide hood of same length and width as utensil washing machine. Provide condensate collecting gutter and drain to [floor drain] [_____]. Slope top, mount, and provide duct opening and collar as specified for Type 5 hoods. Mount at height which avoids interference with machine operation. Provide controls for fans.

][2.10.3 Exhaust Over Dishwashing Machines, Type 7

Provide two rectangular duct chambers, with connections at each end of dishwashing machine, not less than 150 mm 6 inches deep and extending width of dishwashing machine unless otherwise recommended by dishwashing machine manufacturer. Chambers must converge over dishwashing machine at

a 45 degree angle to form a single outlet to exhaust duct. Provide controls for fans.

]2.10.4 Gutter and Drain

Provide inside bottom perimeter with a 75 mm 3 inch face with a 25 mm one inch high flange turned up at a 45 degree angle, to form gutter. Provide a 25 mm one inch stainless steel drain in back corner, extending to specified discharge.

2.10.5 Fan Controls

Provide, for each condensate hood, controls for operating fans. Include manual push buttons labeled "start" and "stop" and labeled light indicating when fans are operating.

2.10.5.1 Hood Exhaust and Supply Fans

****

NOTE: Exhaust fans for kitchen equipment should be centrifugal type with top discharge, adjustable pulleys, and disconnect switches. Protect motor against vapor-laden air stream.

****

Provide in accord with Section 23 30 00 HVAC AIR DISTRIBUTION.

2.10.5.2 Hood Exhaust and Supply Duct

****

NOTE: Duct work to kitchen hoods and for dishwashing machines should be carefully incorporated into Section 23 30 00 HVAC AIR DISTRIBUTION and onto the drawings to assure coordination with kitchen equipment design. The following are necessary:

1. Curbs must conform to NFPA 96.

2. Hood exhaust and supply duct: Minimum 1.2 mm thick 18 gage stainless steel, welded water tight. (Unexposed duct can be galvanized steel). Conform to SMACNA HVAC Duct Const Stds.

****

Provide in accord with Division 23, Section 23 30 00 HVAC AIR DISTRIBUTION.

2.10.6 Condensate Exhaust Hood Connection Provisions

2.10.6.1 Exhaust Duct for Canopy or Noncanopy Condensate Hoods

Construct ducts with 1.3 mm 18 gauge stainless steel. Weld all external seams liquid-tight to hood duct collar as required by NFPA 96. Duct size is based on a minimum air velocity of 4.06 meter/second 800 fpm. Continuously weld duct, liquid tight, to hood duct collar as required by NFPA 96.

2.10.6.2 Hood Support

Support wall mounted or island type hoods from the ceiling structure with stainless steel mounting brackets provided with the hoods. Hanger rods must be 13 mm 1/2 inch diameter stainless steel, threaded at the bottom and designed at the top to fit into inserts in building slats above or hanger attachments fastened to structural steel members. Space hanger rods 1200 mm 48 inch on center, maximum.

2.10.6.3 Make-Up Air Tempered and Untempered

Replace the air volume which is exhausted from a kitchen as required by NFPA 96. Air supplied upstream of the hood suction opening does not qualify as make-up air. The exhaust air flow rate of ventilation of dishwashing equipment must be drawn through the open area between the dishwashing machine and the perimeter entrance of the hood. Provide make-up air diffusers the full length of the front panels, at both sides of the hood producing a low velocity discharge. Provide a supply air plenum with 25 mm one inch thick foil-faced fiberglass insulation at interior of plenum. The temperature differential between make-up air and the air in the conditioned space must not exceed12 degrees C 10 degrees F, except air that is part of the air conditioning system or air that does not decrease comfort conditions of the occupied space.

2.10.6.4 Vapor Proof Hood Lights and Wiring

Provide U.L. listed, recess mounted, gasketed vapor-proof fluorescent light fixtures conforming to UL 1598,[the full length of the hood][as shown on the drawings]. Provide, at Type 2 and Type 3 hoods, incandescent or fluorescent lights in accord with UL 1598. Prewire the light fixtures to junction box at a rear free corner. Use Cool white T-8 energy efficient lamps.

2.10.6.5 Closure Panels

Provide vertical corner mullions at removable closure panels, 50 by 50 mm 2 by 2 inch wide, 1.6 mm 16 gauge stainless steel, and weld integrally to furring and head channel. Provide exhaust hood closure panels 13 mm 1/2 inch pan-formed 1.3 mm 18 gauge stainless steel. Retain the upper edge of the panel in a 25 by 50 mm 1 by 2 inch continuous 1.6 mm 16 gauge stainless steel head channel secured to the hood superstructure. Mount the lower edge of the panels on perimeter furring cap, and turn back 25 mm one inch for "zee" clip retention.

2.10.7 Ducts at Dishwashing Machines

Provide ducts at dishwashing machines consisting of two vertical ducts, one at each end of the dishwasher. Construct exposed, seamless, ducts of not less than 1.3 mm 18 gauge stainless steel and size to accommodate the machine exhaust vent. The intake of each duct must be at the top edge of the dishwasher and extend to 150 mm 6 inch above the finished ceiling for final connection. Trim the duct at the ceiling with a 1.6 mm 16 gauge stainless steel angle flange with corners welded. Connect the exhaust outlet to the exhaust system.

2.10.8 Duct Openings

Provide duct openings with collars of quantity/size as indicated, with a stainless steel louvered grille at the openings. Trim and seal all

penetrations of the dishwashing machine duct risers through the hood body.

[2.10.8.1 Ceiling Recessed Exhaust Hood at Dishwashing Machines

****
NOTE: Use this paragraph for projects where ceiling height limitations require a recessed hood.
****

Provide hood over dishwashing machines constructed of 1.6 mm 16 gauge stainless steel with all seams welded, ground, and polished. Slope both long sides up to 450 mm 18 inch interior height from 150 mm 6 inches above bottom edge. Body must have a 50 mm 2 inch wide perimeter flange turned-up 19 mm 3/4 inch at 90 degrees (increase to 250 mm 10 inch width at supply air diffusers). Provide make up air diffusers at vertical [interior] [exterior] length of hood. Provide duct openings with collars of quantity/size as indicated, with a stainless steel louvered grille at the openings. Trim and seal all penetrations of the dishwashing machine duct risers through the hood body.

]]2.11 GARBAGE DISPOSAL MACHINES

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NOTE: When scrap trough is located on front of soiled dish table with a disposer in center and scrapping being done on each side, provide the disposer with an off-set head so disposer does not extend beyond dishtable.
****

Provide floor-mounted type disposer conforming to ASSE 1009, with cast alloy body supported on adjustable tubular legs. Attach waste chamber lid with quick-release clamps. Connect hopper to disposal with a flexible sleeve of molded neoprene, held in place with stainless steel clamps.[Provide an offset head.]

2.11.1 Disposal Cone

Fabricate with approximate diameters of 450 mm 18 inches inside unit and 200 mm 8 inches at throat. Provide neoprene silver trap at throat and water swirl inlet in cone to create counterclockwise rotation. Secure cone to disposer with flexible connector sleeve and stainless steel clamps.

2.11.2 Motor

Mount motor with 75 mm 3 inch minimum clearance above floor. Provide with magnetic starter with overload and under-voltage protection timer for 0 to 5 minutes, panel cover interlock, fused disconnect, prewired solenoid, vacuum breaker, two water flow controls, and automatic reversing action. Provide cast alloy rotor carrying rigid impact bars and fixed directly onto motor shaft. Provide motors of the following minimum sizes on disposals at locations listed:

a. Pot and pan sink: 3.75 kw 5 horsepower

b. Soiled dishtable: 5.60 kw 7.5 horsepower.

2.11.3 Disposal Control Center

Include time delay relay, start and stop buttons, panel cover interlock with fused safety disconnect switch and circuit breaker, door locking feature that prevents opening door with power on, full voltage magnetic starter with both overload and under-voltage protection, and solenoid valve. Control center must be waterproof and fabricated using stainless steel and in accord with NEMA ICS 6. Provide controls conforming to NEMA ICS 2.

2.12 DRAINS

Provide cleanout for all drains. Locate drains so that drain lines from equipment are not located in any portion of a walking surface or produce a tripping or burn hazard.

2.13 DRAIN TRENCH LINER/GRATING

****

NOTE: Indicate on the drawings, required dimensions, details, and coordinate with floor plan layout. Drain trench liner/grating system must be provided with a complete drainage system. Trench must be capable of being readily cleaned out without the removal of bolts or screws to gain access.

****

Provide 1.9 mm 14 gauge stainless steel drain trench liner/grating in sizes as indicated with a 25 mm one inch wide perimeter shoulder at the top, turned up flush and level with finished floor, tight-hemmed back down to the shoulder level and flanged out 50 mm 2 inch for attachment to the slab.

2.13.1 Interior of the Liner

Interior of the liner must be 150 mm 6 inch deep with corners coved on 19 mm 3/4 inch radius; sloped and scored 25 mm one inch to an integrally welded box pattern drain (drain housing only). Provide drains at 1200 mm 48 inch on center maximum and fit with 150 mm 6 inch long welded tailpiece. Connect a safety chain to the basket strainer assembly and the top of the liner wall. Underside of sloping portion of liner must have 50 mm 2 inch long "zee" clips.

2.13.2 Aluminum Grating

Provide aluminum grating, removable without the use of tools, with 38 by 5 mm 1-1/2 by 3/16-inch bearing bars and a perimeter frame. Close bearing bars must have a 33 by 100 mm 1-5/16 by 4 inch centerline to centerline grid. Provide section quantities and sizes as indicated on the drawings with a maximum of 600 mm 24 inch long sections.

PART 3 EXECUTION

3.1 INSTALLATION

Do not install items that show visual evidence of biological growth.

3.1.1 General

Install in accord with the manufacturer's printed instructions.

3.1.2 Cutting and Patching of Construction

Lay out work in advance to prevent damage to building, piping, wiring, or equipment as a result of cutting for installation.

3.1.3 Setting and Connecting

Install equipment plumb and level. Except for mobile and adjustable-leg equipment, securely anchor and attach items and accessories to walls, floors, or bases with stainless steel bolts. Flash food service cabinets located in wall openings to the walls with 0.9 mm thick 20 gage stainless steel. Seal around equipment flashing and flanges, at walls, floor, and ceiling in accord with Section 07 92 00 JOINT SEALANTS. Fillers must be continuous, without opening.

3.1.4 Plumbing Work

Refer to Section 11 05 40 COMMON WORK RESULTS FOR FOOD SERVICE EQUIPMENT.

3.1.5 Electrical Work

Electrical systems, components and accessories must be certified to be in accordance with NFPA 70 and the following:

3.1.5.1 Installed Equipment Load

If the electrical load of the approved equipment differs from that specified or shown on the drawings, provide and install electrical service compatible with the approved equipment.

3.1.5.2 Electrical Equipment and Components

Food service equipment furnished under this section must have loads, voltages, and phases compatible with building system, and conform to manufacturer standards.

3.1.5.3 Cords and Caps

Coordinate all food service equipment cord/caps with related receptacles. All 120/208/240 volt "plug-in" equipment must have Type SO or SJO cord and a plug with ground, fastened to frame/body of item. Provide mobile equipment with a strain-relief assembly at the cord connection of the appliance. Mobile electrical support equipment (heated cabinets, dish carts, etc.) and counter appliances mounted on mobile stands (mixers, food cutter, toaster, coffee makers, microwave ovens, etc.) must have cord/cap assembly with cord-hanger as provided by the manufacturer.

3.1.5.4 Switches and Controls

Equip each motor-driven appliance or electrically-heated unit with control switch and overload protection per UL 197 and UL 471. Switches, controls, control transformers, starters, equipment protection and enclosures must be Industry Standards for the related equipment environment.

3.1.5.5 Motors

Provide motors at 120, 240, 208/240 and 460/480 volts with starter, overload protection, and short circuit motor protection per manufacturer standards.

3.1.5.6 Heating Elements

Provide thermostatic controls for all electrically heated equipment. Equip water heating equipment with a positive low-water shut-off.

3.1.5.7 Receptacles and Switches

Install receptacles which are located in vertical panels of closed base bodies in 300 by 215 by 75 mm 12 by 8-1/2 by 3 inch deep recessed mounting panel sloped on a 60-degree angle and turned up to the top of the opening. Prewire receptacles which are located in closed base fixtures to a junction box located within 150 mm 6 inch from the bottom of the utility compartment. Horizontally mount receptacles which are installed in/on fabricated equipment in a metal box with a stainless steel cover plate.

3.1.5.8 Light Fixtures

Prewire light fixtures with lamps which are installed in/on fabricated or field-assembled equipment to a junction box for final connection (fixtures must be continuous run when indicated). Install fluorescent display light the full-length of the display stand and serving shelf with stud bolts or as indicated, and prewire through a support post to a recess-mounted switch. Install heat lamps to underside of serving shelf assemblies as specified. Heat lamp length for chassis must be sized per manufacturer or as indicated on the drawings. Electrically connect cold storage light fixtures through the hub fitting located on the top of the fixture. Horizontal conduit must be above the ceiling panels. Install plastic sleeves through ceiling panels for electrical conduit and seal all penetrations airtight at both sides of panel.

3.1.5.9 Final Electrical Connection Provisions

Tag final electrical connection points of equipment with item number, name (as indicated on FOOD SERVICE EQUIPMENT SCHEDULE) of devices on the circuit, total electrical load, voltage, and phase. Fabricated equipment containing electrically-operated components or fittings, indicated on utility connections drawings to be direct-connected, must have each component, fitting, or group thereof prewired to a junction box for final connection. Refer to the drawings for circuit loading.

Field-assembled equipment (example, prefabricated cold storage assemblies, conveyor systems, exhaust hoods) must have electrical components completely interconnected by this section for final connection as indicated on utility connection drawing. Prewire the following groups of cold storage assembly electrical devices to a top-mounted junction box for final connection per compartment grouping, unless otherwise indicated.

a. Light fixtures, switches, and heated pressure-relief vent.

b. Door/jamb heater and temperature monitors/alarms.

c. Evaporator fans, defrost elements, freezer fan door switch, and drain line heaters.

3.1.5.10 Lamps

Provide food service equipment containing light fixtures with standard appliance type bulbs or energy efficient appliance type bulbs as indicated on the drawings. Exposed fluorescent lamps above or within a food zone must have plastic coated T-8 energy efficient lamps or standard lamps, sleeved in plastic tube with end caps.

3.1.6 Cleaning and Adjusting

Test and adjust equipment for proper operation. Test rotating components and motors for proper rotation. Lubricate moving parts if suggested by manufacturer's literature. Prior to acceptance of project, clean and sanitize equipment both inside and outside.

a. Light fixtures, switches, and heated pressure-relief vent.

b. Door/jamb heater and temperature monitors/alarms.

c. Evaporator fans, defrost elements, freezer fan door switch, and drain line heaters.

3.1.7 Installation of Hoods

Install in accord with NFPA 96. Install hoods to remain free from vibration under all conditions of operation.

3.1.8 Floor Screeds

Anchor, install, and seal in accord with the recommendations of the manufacturer of the walk-in unit.

3.2 FIELD INSPECTIONS AND TESTS

3.2.1 Inspections

Inspect equipment, fixtures, and material after installation for compliance with the applicable standards and as specified in Section 11 05 40 COMMON WORK RESULTS FOR FOOD SERVICE EQUIPMENT.

3.2.2 Field Test Reports

Upon completion of inspection perform operational tests on each piece of equipment to determine that equipment and components, including controls, safety devices, and attachments, operate as specified and are properly installed and adjusted. Test all water, drain, gas, steam, oil, refrigerant, and liquid carrying components for leaks. Notify the Contracting Officer 14 calendar days prior to testing.

3.3 MANUFACTURER'S WARRANTY

Submit all manufacturers' signed warranties to Contracting Officer prior to final commissioning and acceptance.

3.4 CONTRACTOR'S WARRANTY FOR INSTALLATION

Submit contractor's warranty for installation to the Contracting Officer prior to final commissioning and acceptance.

-- End of Section --