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USACE / NAVFAC / AFCESA / NASA **UFGS-11 44 00 (January 2008)**

Preparing Activity: USACE **Superseding**
UFGS-11 40 00.00 20 (April 2006)
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UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2012

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SECTION 11 44 00

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01/08

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SECTION 11 44 00

FOOD COOKING EQUIPMENT
01/08

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NOTE: This guide specification covers the requirements for commercial cooking equipment.

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 items(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).

****

PART 1 GENERAL

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NOTE: This guide specification includes baking ovens, broilers, cooking ovens, exhaust hoods (and related fire suppression and grease extraction equipment, fryers, griddles, grills, holding ovens, kettles, microwave ovens, ranges, rotisseries, steamers, steam kettles, etc.

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 accordance with NAVFSSOcurrent US Army Quartermaster Center and School equipment schedule specified design requirements, including Energy Star qualified model list.

3. Floor, wall, and ceiling penetrations.

4. Raised bases, retainer curbs, or depressions.

5. Recessed, grated floor drains required for equipment.

6. Exhaust fan curbs, supply fan curbs, exhaust duct, supply duct, and ductwork material.

7. Fire system CO2 tanks,actuating stations.

8. Hoods, plumbing enclosure housing and control panel of automatic washdown system.

9. Disconnect switches.

10. Electrical chases and raceways and plumbing chases.

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

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

14. Utility connections to building water, sanitary, gas, electrical, sprinkler, fire alarm, oil, compressed air, steam, and other utility systems. Convenience outlets at point of use for plug-in equipment.

****

1.1 GENERAL RELATED SECTIONS AND STANDARDS

****
NOTE: Designate plumbing fixtures as "P" items on plumbing drawings with specific requirements added to Section 22 00 00 PLUMBING, GENERAL PURPOSE.
****

a. Refer to section 11 05 40 COMMON WORK RESULTS FOR FOODSERVICE EQUIPMENT for general requirements. Provide detailed Food Service Equipment Schedule as specified in Section 11 06 40.13 FOOD SERVICE EQUIPMENT SCHEDULE.

b. Provide detailed Food Service Equipment Schedule conforming to DOD 4000.25-1-M.

c. Gas-burning equipment must be designed for operation with the type of gas specified and be approved by CSA, conforming to CSA C22.2 No. 109 and CSA Directory.

d. All electrical work must conform to NFPA 70.

e. Provide wet chemical fire extinguishing systems in accordance with Section 21 21 03.00 10 WET CHEMICAL FIRE EXTINGUISHING SYSTEM.

f. Provide connections as part of building sprinkler system, Section 21 13 13.00 20 WET PIPE SPRINKLER SYSTEM, FIRE PROTECTION.

g. Grease extracting type hoods that have an internal hood fire protection system do not require wet chemical fire extinguishing protection for those components of the exhaust system, and for cooking equipment protected by a UL listed internal hood fire protection system complying to NFPA 96.

1.2 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 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 SOCIETY OF SANITARY ENGINEERING (ASSE)

ASSE 1001	(2008) Performance Requirements for Atmospheric Type Vacuum Breakers (ANSI approved 2009)

AMERICAN WELDING SOCIETY (AWS)

AWS A5.8/A5.8M	(2011) Specification for Filler Metals for Brazing and Braze Welding
AWS D1.1/D1.1M	(2010) Structural Welding Code - Steel
AWS D10.4	(1986; R 2000) Recommended Practices for

	Welding Austenitic Chromium-Nickel Stainless Steel Piping and Tubing
AWS D9.1M/D9.1	(2006) Sheet Metal Welding Code

CSA STANDARDS (CSA)

CSA C22.2 No. 109	(1981; R 2009) Commercial Cooking Appliances
CSA Directory	(updated continuously online) Product Index

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2010) Standard for Portable Fire Extinguishers
NFPA 54	(2012) National Fuel Gas Code
NFPA 70	(2011; TIA 11-1; Errata 2011; TIA 11-2; TIA 11-3; TIA 11-4) National Electrical Code
NFPA 96	(2011) Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

NSF INTERNATIONAL (NSF)

NSF/ANSI 169	(2009)Special Purpose Food Equipment and Devices
NSF/ANSI 2	(2010) Food Equipment
NSF/ANSI 4	(2009) Commercial Cooking, Rethermalization and Powered Hot Food Holding and Transport Equipment
NSF/ANSI 51	(2009e) Food Equipment Materials
NSF/ANSI 52	(2009) Supplemental Flooring

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

SMACNA 1767	(2001) Kitchen Ventilation Systems & Food Service Equipment Fabrication & Installation Guidelines, 1st Edition
SMACNA 1966	(2005) HVAC Duct Construction Standards Metal and Flexible, 3rd Edition

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD 4000.25-1-M	(2006) MILSTRIP - Military Standard Requisitioning and Issue Procedures

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

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

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

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910-SUBPART D	Walking - Working Surfaces

UNDERWRITERS LABORATORIES (UL)

UL 1598	(2008; Reprint Jan 2010) Luminaires
UL 197	(2010; Reprint Jun 2011) Commercial Electric Cooking Appliances
UL 489	(2009; Reprint Jun 2011) Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures
UL 710	(1995; Reprint Jun 2010) Exhaust Hoods for Commercial Cooking Equipment
UL 763	(2000; Reprint Jul 2010) Standard for Motor-Operated Commercial Food Preparing Machines
UL Elec Equip Dir	(2011) Electrical Appliance and Utilization Equipment Directory

1.3 SYSTEM DESCRIPTION

****

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[and 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 for final connection of equipment.

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 NAVFSD at commercial telephone (717) 790-7580 or DSN 430-7580.

Indicate on drawings the location of each manual activation station.

****

The work includes [furnishing and] [installing] [and modifying existing] food service cooking equipment and related work. Verify all existing dimensions, contract drawings, product data and all related conditions prior to commencing rough-in work.

a. Protect each exhaust hood system that serves cooking equipment, associated exhaust hood system ducts, and all cooking equipment served by the exhaust hood system with a wet chemical fire extinguishing system.

b. Submit detail drawings, as specified,including insulation and utility requirements for all food cooking equipment, custom fabricated equipment, along with equipment schedule. Drawings shall be 1:50 1/4 inch scale minimum. Schedule in the same format as the equipment schedule on the drawings.

c. 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.

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

1.4 SUBMITTALS

****

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project.

The Guide Specification technical editors have designated 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 submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation 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.

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" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.] [information only. When used, a designation following the "G" designation 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][; G, [_____]]

SD-02 Shop Drawings

Detail Drawings[; G][; G, [_____]]
Schedule[; G][; G, [_____]]
Energy Star qualified
Exhaust Hoods Over Cooking Equipment[; G][; G, [_____]]
Utilities[; G][; G, [_____]]
Custom Fabricated Equipment[; G][; G, [_____]]
Installation Instructions and Diagrams[; G][; G, [_____]]

SD-03 Product Data

Commercial food cooking equipment
Exhaust Hoods Over Cooking Equipment[; G][; G, [_____]]

SD-06 Test Reports

Field Test Reports[; G][; G, [_____]]
Exhaust Hood Air-Balance Report[; G][; G, [_____]]

SD-07 Certificates

NSF Certification[; G][; G, [_____]]
UL Certification[; G][; G, [_____]]
Energy Star Qualified

PART 2 PRODUCTS

2.1 EXHAUST HOODS OVER COOKING EQUIPMENT

****

NOTE: Seismic restraints for kitchen hoods must conform to Guidelines for Seismic Restraints of Kitchen Equipment (SMACNA Los Angeles Chapter). See Appendix 1 of SMACNA Fabrication Guidelines. Include requirement in seismic zones 3 and 4.

Hood design will be in accordance with NFPA 96, ASHRAE, and the ACGIH Industrial Ventilation Handbook. Designer will indicate type, size, shape, make-up air, and detail of hoods 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. Grease extracting automatic washdown hoods will be specified for new construction. Filter type hoods may be used in existing facilities where conditions prevent the use of grease extractor hoods.

****

Conform to NFPA 96 and UL 710. Conform to SMACNA 1966. [Provide seismic restraints in accordance with SMACNA 1767.] The hood shall not vary from design listing of air requirements or static pressure by more than five percent. Fabricate from 1.2 mm 18 gage thick stainless steel. Run electrical wiring in conduit or raceways. When total hood length is more than 3600 mm 12 feet long, provide hoods individually complete in all respects, of approximately equal length less than 3600 mm 12 feet long, and mounted end to end.

2.1.1 Centrifugal Grease-Extracting Hoods

Fabricate in factory. Provide high-velocity type with average throat inlet air velocity of [5] [_____] mps [1,000] [_____] fpm and duct velocity of [9] [_____] mps [1,800] [_____] fpm. Provide air inlet above and parallel to equipment for full length of hood. Provide hood which will remove 95 percent of extraneous matter in air with non-removable grease-extracting baffles located in plenum chamber. The use of filters, cartridges, rotating parts, removable parts, or constantly running water is not acceptable.

2.1.1.1 Types of Hoods

****

NOTE: Delete types not indicated for the project. If a type is not used, state "not used" at the subparagraph, to avoid renumbering.

****

Provide the following hood types as indicated:

a. Serve-Over Shelf; Type 1: Provide over [charbroilers,] [fryers,] [_____,] [and] [griddles] on serving lines. Mount hood 1370 to 1450 mm 54 to 57 inches above finished floor.

b. Island; Type 2: Provide over [steam-jacketed kettles,] [fry pans,] [ovens,] [broilers,] [_____,] [and] [steamers] located remote from walls. Mount at height indicated.

c. Wall-Mounted, Free-Standing; Type 3: Provide over [ranges,] [_____,] [broilers,] [doughnut fryers,] [griddles,] [ovens,] [steam-jacketed kettles,] [and] [fryers] located along wall. Mount at height indicated.

d. Low Ceiling; Type 4: Provide over [_____] [and] [_____] where low ceiling restricts installation of Type 1, 2, or 3.

2.1.1.2 Features

Provide the following:

a. Automatic washdown system.

b. Fan control.

****
NOTE: Delete references to fire dampers in air inlet if fire dampers are included in exhaust ductwork connecting to hood.
****

c. Damper controls.

d. Fan control station and plumbing enclosure.

e. Fire protection system, for hoods over [tilting frying pans,] [charbroilers,] [fryers,] [griddles,] [doughnut fryers,] [_____,] [deep-fat fryers,] [and] [broilers].

f. Vapor-proof lights.

2.1.1.3 Automatic Washdown System

Provide system that automatically washes internal portions of hood for an adjustable period of between 0 and 15 minutes. Provide for activation by time clock or upon operation of fire damper.

a. Features of Operation:

(1) Shut off supply and exhaust fans, if running, at beginning of cleaning cycle.

(2) Subject accumulated contaminates on internal surfaces with water at [60] [82] degrees C [140] [180] degrees F and a water pressure of 0.275 MPa 40 psi. Provide pressure reducing valve.

(3) [Pump] [Inject] detergent into hot water supply line to create wash-water.

(4) Provide scrubbing action by directing wash-water through manifolds and then through spray nozzles placed so that all internal surfaces are reached with streams of wash-water.

(5) Collect wash-water and grease within hood and pipe to outside of hood to point indicated for indirect connection to building plumbing system.

(6) End wash cycle by timer.

b. Plumbing Components: Provide brass or stainless steel spray heads or nozzles and stainless steel distribution manifold in each hood. Provide the following in fan control station and plumbing enclosure:

(1) Water solenoid valve

(2) Shut-off valve

(3) Shock absorber

(4) Pressure gage

(5) Temperature gage

(6) Line strainer

(7) Vacuum breaker, conforming to ASSE 1001

(8) Detergent reservoir, one gallon minimum

(9) Detergent [pump] [injector]

(10) Check valve

(11) Timer

(12) Pressure reducing valve

2.1.1.4 Fan Control

Locate in fan control station and plumbing enclosure. Provide delay-time starter on starter leg of exhaust fan so supply fan starts first and run 5 seconds before exhaust fan starts, to insure the required balance in exhausted and make-up air flow. Provide the following operations:

a. Interconnection with washdown system to effect shutoff.

****
NOTE: Delete references to fire dampers in air inlet if fire dampers are included in exhaust ductwork connecting to hood.
****

b. Interconnection with fire dampers to effect shutoff of fans.

c. Operation by time clock.

d. Operation by manual push buttons labeled "start" and "stop".

2.1.1.5 Fire Damper

****
NOTE: Delete references to damper if fire dampers are included in exhaust ductwork connecting to hood.
****

Provide mechanically driven damper and damper control. Activate by heat-sensing thermostat set to react to temperature of 176 degrees C 350 degrees F in exhaust duct at hood. Activation of damper must cause the following additional actions:

a. Shut off exhaust and supply fans of hood.

b. Shut off fuel source and electric power to equipment under hood.

c. Initiate automatic washdown system.

2.1.1.6 Fan Control Station and Plumbing Enclosure

****
NOTE: Do not locate control cabinet for hoods on serving line tray slide support walls or on drop

wall above serving line tray slide.

****

Provide flush-mounted enclosure. Wire and plumb in factory. Include the following:

a. Plumbing components of washdown system.

b. Components required for fan control, including manual push buttons and interlocks with other systems.

c. Components required to operate fire protection system.

d. Time clock capable of being programmed by the week to operate fan system and automatic washdown system and of maintaining time cycle after being overridden by manual push buttons.

e. Labeled light indicating when exhaust fan and supply fan are operating.

f. Labeled light indicating when automatic washdown system is operating.

2.1.1.7 Fire Protection Systems

****

NOTE: Select fire protection system based on cost and local regulations. If kitchen cannot tolerate time lost for clean-up in event of dry chemical release, or if kitchen return air is tied into building system return air, do not use that system. Ensure that actuating systems are indicated on drawings.

****

Provide a pre-engineered [[dry] [wet] chemical system in accordance with Division 21, Section 21 23 00.00 20 DRY CHEMICAL FIRE EXTINGUISHING FOR KITCHEN CABINET] [[liquid foam system] [water spray system] in accordance with NFPA 96]. [Include water spray in plenum of hood.] Include micro-switch for electric power and fuel shut off to equipment under hood and a fuel shut-off and reset button. Exposed piping under hood and surface nozzles to be stainless steel or chrome plated. Paint exposed piping running to hood with rust-inhibiting aluminum paint. Provide electrical wiring, contactors, shunt breakers, electrical control for gas valves, and other electrical components required to install fire systems in accordance with Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM.

a. Actuating Stations. Provide manual actuating station and remote manual actuating station as indicated. Clearly label actuating station as "Hood Fire Protection" and specific device protected.

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NOTE: If water spray system is specified, make sure it is compatible with building sprinkler system.

****

b. Water Spray Fire System In Grease-Extracting Type Hood: Include wall-mounted control panel with pilot lights for indicating when system is operational, not operational, and on fire alert. Provide audible

fire alarm, unions, hand valve, valve switch, and pressure switch. Include duct nozzles and plenum nozzles. Provide water pipe to control panel and from control panel to hood. Provide connections as part of building sprinkler system, Section 21 13 13.00 20 WET PIPE SPRINKLER SYSTEM, FIRE PROTECTION.

****
NOTE: If exhaust hood fire system is to be connected to building alarm system, the work must be included in other sections and coordinated.
****

c. Alarm Connection: Provide capability to signal operational readiness and to generate electronic signal when hood fire system is activated. Provide connection point for building alarm system. Provide system to connection point and connect in accordance with Section [_____][28 31 74.00 20 INTERIOR FIRE ALARM SYSTEM].

2.1.1.8 Vapor proof Lights

Provide,[at Type 2 and Type 3 hoods,] incandescent or fluorescent lights in accordance with UL 1598 or UL 1598. Locate switches for operating hood lights on face of hood in lower [right] [_____] corner.

2.2 Commercial Food Cooking Equipment

a. All commercial cooking equipment shall conform to 29 CFR 1910, CSA, NSF, UL and other related standards as stated herein and in Section 11 05 40 COMMON WORK RESULTS FOR FOODSERVICE EQUIPMENT. Supply all gas fueled appliances with installed automatic shut-off device(s), as well as manual shut-offs device conforming to NFPA 96.

b. Electrical cooking appliances must conform to UL 197, UL 489. UL 763, and UL Elec Equip Dir.

c. [All commercial cooking equipment must conform to Energy Star labeling to confirm being Energy Star Qualified. All equipment must bear NSF Certification and UL Certification labels.]

2.2.1 Gas Burners

In accordance with NFPA 54, equip burners and pilots located in enclosed compartments with automatic shut off of gas supply if burners fail to ignite, or pilot is extinguished.

[2.2.2 Specialty Cooking Equipment

Conform to the requirements of NSF/ANSI 169, NSF/ANSI 2, NSF/ANSI 4, and NSF/ANSI 51. Floor areas adjacent to cooking areas must conform to NSF/ANSI 52 and 29 CFR 1910-SUBPART D.

][2.3 BAKING OVEN

[_____]

][2.4 BROILER

[_____]

][2.5 DEEP FRYERS

[_____]

][2.6 GRIDDLE

[_____]

][2.7 STEAM COOKERS

[_____], [3][4][5][6] pan

]2.8 PORTABLE FIRE EXTINGUISHER

Wall mount portable fire extinguisher conforming to NFPA 10, within [_____] feet of cooking area.

PART 3 EXECUTION

3.1 INSTALLATION

Perform installation in accordance with the manufacturer's printed instructions. Refer to section 11 05 40 COMMON WORK RESULTS FOR FOODSERVICE EQUIPMENT for detailed installation, project closeout, and warranty requirements. Lay out work in advance to prevent damage to building, piping, wiring, or equipment as a result of cutting for installation.

3.1.1 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 20 gage thick stainless steel. Seal around equipment flashing and flanges, at walls, floor, and ceiling in accordance with Section 07 92 00 JOINT SEALANTS. Fillers shall be continuous, without opening.

3.1.2 Welding Field Joints

Weld stainless steel by the electric fusion method. Provide where required by and in accordance with AWS A5.8/A5.8M, AWS D1.1/D1.1M, AWS D10.4, AND AWS D9.1M/D9.1. Accomplish brazing with silver solder for joining copper tubing to brass and bronze connection fitting and for no other purpose.

3.1.3 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.

3.1.4 Installation of Hoods

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

3.2 FIELD INSPECTIONS AND TESTS

Inspect equipment, fixtures, and material after installation for compliance with the applicable standards. 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. Submit Field Test Reports and [_____] copies of the Exhaust Hood Air-Balance Report to the Contracting Officer.

-- End of Section --