UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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SECTION TABLE OF CONTENTS

DIVISION 11 - EQUIPMENT

SECTION 11 05 40

COMMON WORK RESULTS FOR FOODSERVICE EQUIPMENT

08/17, CHG 1: 02/18

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL REQUIREMENTS
1.2.1 Mechanical General Requirements
1.2.1.1 American Gas Association Laboratories Standards
1.2.2 Electrical General Requirements
1.2.3 Electromagnetic Interference Suppression
1.2.4 Fungus Treatment of Electrical Components
1.3 DESCRIPTION OF WORK
1.3.1 Design Requirements
1.4 SUBMITTALS
1.5 QUALITY ASSURANCE
1.5.1 Energy Star Labeled Model List
1.5.2 National Sanitation Foundation Standards
1.5.3 Standard Products
1.5.4 Nameplates
1.5.5 Underwriters Laboratories Standards
1.5.6 Pre-Installation Conference
1.6 DELIVERY, STORAGE, AND HANDLING
1.6.1 Delivery
1.6.2 Storage of Equipment and Accessories
1.6.3 Protection of Fixed/Fabricated Manufactured Equipment
1.6.4 Prohibited Use of Equipment
1.6.5 Damaged Equipment

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Stainless Steel, Sheets and Formed, Nonmagnetic
2.1.2 Stainless Steel Pipe, Tubing and Bars
2.1.3 Galvanizing Repair Compound
2.1.4 Brazing and Braze Welding Material
2.1.5 Steel Structural Shapes for Framing

2.1.6 Coatings
2.1.6.1 Exterior Parts
2.1.6.2 Chromium Plating
2.1.7 Zinc-Coated Steel
2.1.7.1 Sheets and Shapes
2.1.8 Brass Piping and Fittings
2.1.9 Copper Tubing and Fittings
2.1.10 Solder Material
2.1.10.1 Lead-Free Solder
2.1.10.2 Tin-Lead Solder
2.1.10.3 Silver Solder
2.1.11 Laminated Plastics
2.1.12 Sealants
2.2 CONSTRUCTION OF FABRICATED EQUIPMENT
2.2.1 Grinding, Polishing, and Finishing
2.2.2 Fastening Devices
2.2.3 Welding
2.2.3.1 Welds
2.2.3.2 Welding Rods
2.2.3.3 Weld Quality
2.2.4 Built-in Equipment Lighting
2.2.5 Sound Deadening of Counters and Sinks
2.2.6 Heat Lamp/Display Wiring
2.2.6.1 Heat Lamps
2.2.6.2 Display Light Modules

PART 3 EXECUTION

3.1 INSTALLATION
3.1.1 Equipment Connections
3.1.2 Backflow Preventers
3.1.3 Gas Equipment
3.1.4 Electrical Work
3.1.4.1 Installed Equipment Load
3.1.4.2 Electrical Equipment and Components
3.1.4.3 Cords and Caps
3.1.4.4 Switches and Controls
3.1.4.5 Motors
3.1.4.6 Heating Elements
3.1.4.7 Receptacles and Switches
3.1.4.8 Light Fixtures
3.1.4.9 Final Electrical Connection Provisions
3.1.4.10 Lamps
3.1.5 Plumbing Work
3.1.5.1 Steam Connection Provisions
3.2 MANUFACTURER'S FIELD SERVICES
3.3 LOCATIONS AND CLEARANCES
3.4 IDENTIFICATION TAGS AND PLATES
3.5 OPERATION AND MAINTENANCE MANUALS
3.6 INSTRUCTIONS TO GOVERNMENT PERSONNEL
3.7 TESTS
3.7.1 Initial Start-Up and Operational Test
3.7.2 Test Reports
3.7.3 Cleaning and Adjusting
3.8 MANUFACTURER'S WARRANTY
3.9 CONTRACTOR'S WARRANTY for INSTALLATION

-- End of Section Table of Contents --

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USACE / NAVFAC / AFCEC / NASA	**UFGS-11 05 40 (August 2017)** **Change 1 - 02/18** **----------**
Preparing Activity: NAVFAC	**Superseding** **UFGS-11 05 40 (August 2008)**

UNIFIED FACILITIES GUIDE SPECIFICATIONS

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SECTION 11 05 40

COMMON WORK RESULTS FOR FOODSERVICE EQUIPMENT
08/17, CHG 1: 02/18

****
NOTE: This guide specification covers the requirements for general requirements and common works result for foodservice equipment[for all land-based naval facilities.].

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: Use this section in conjunction with Section 11 06 40.13 FOOD SERVICE EQUIPMENT SCHEDULE; and other foodservice related sections within the project scope, to address general guidelines for the work results expected. Other food service sections include, but are not limited to:

Section 11 41 11 - REFRIGERATED AND FROZEN FOOD STORAGE EQUIPMENT

Section 11 42 00 - FOOD PREPARATION EQUIPMENT

Section 11 44 00 - FOOD COOKING EQUIPMENT

Section 11 46 00 - FOOD DISPENSING EQUIPMENT

Section 11 47 00 - ICE MACHINES

Section 11 48 00 - CLEANING AND DISPOSAL EQUIPMENT

Section 12 35 39 - COMMERCIAL KITCHEN CASEWORK.

****

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.

****

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 HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ANSI/ASHRAE 15 & 34	(2013) ANSI/ASHRAE Standard 15-Safety Standard for Refrigeration Systems and ANSI/ASHRAE Standard 34-Designation and Safety Classification of Refrigerants

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME A112.19.3/CSA B45.4	(2022) Stainless Steel Plumbing Fixtures
ASME B16.15	(2018) Cast Copper Alloy Threaded Fittings Classes 125 and 250
ASME B16.18	(2021) Cast Copper Alloy Solder Joint Pressure Fittings
ASME B16.22	(2021) Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
ASME B16.26	(2018) Standard for Cast Copper Alloy

	Fittings for Flared Copper Tubes

AMERICAN WELDING SOCIETY (AWS)

AWS A5.8/A5.8M	(2019) Specification for Filler Metals for Brazing and Braze Welding
AWS D1.1/D1.1M	(2020; Errata 1 2021) Structural Welding Code - Steel
AWS D9.1/D9.1M	(2018) Sheet Metal Welding Code
AWS D10.4	(1986; R 2000) Recommended Practices for Welding Austenitic Chromium-Nickel Stainless Steel Piping and Tubing

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M	(2019) Standard Specification for Carbon Structural Steel
ASTM A123/A123M	(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A240/A240M	(2023) Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM A269/A269M	(2022) Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
ASTM A270/A270M	(2023) Standard Specification for Seamless and Welded Austenitic and Ferritic/Austenitic Stainless Steel Sanitary Tubing
ASTM A276/A276M	(2017) Standard Specification for Stainless Steel Bars and Shapes
ASTM A480/A480M	(2023) Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
ASTM A653/A653M	(2023) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A666	(2023) Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar
ASTM B32	(2020) Standard Specification for Solder Metal

ASTM B43	(2020) Standard Specification for Seamless Red Brass Pipe, Standard Sizes
ASTM B88	(2022) Standard Specification for Seamless Copper Water Tube
ASTM B88M	(2020) Standard Specification for Seamless Copper Water Tube (Metric)
ASTM C920	(2018) Standard Specification for Elastomeric Joint Sealants
ASTM C1330	(2023) Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants
ASTM D520	(2000; R 2011) Zinc Dust Pigment

CSA GROUP (CSA)

CSA Directory	(updated continuously online) Product Index

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ANSI/NEMA LD 3	(2005) Standard for High-Pressure Decorative Laminates
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
NEMA MG 1	(2021) Motors and Generators
NEMA MG 2	(2014) Safety Standard for Construction and Guide for Selection, Installation and Use of Electric Motors and Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 54	(2021) National Fuel Gas Code
NFPA 70	(2023) National Electrical Code

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 6	(2023) Dispensing Freezers

NSF/ANSI 7	(2023) Commercial Refrigerators and Freezers
NSF/ANSI 8	(2021) Commercial Powered Food Preparation Equipment
NSF/ANSI 14	(2022) Plastics Piping System Components and Related Materials
NSF/ANSI 35	(2020) High Pressure Decorative Laminates for Surfacing Food Service Equipment
NSF/ANSI 37	(2021) Air Curtains for Entranceways in Food and Food Service Establishments
NSF/ANSI 51	(2023) Food Equipment Materials
NSF/ANSI 59	(2020) Mobile Food Carts
NSF/ANSI 169	(2019)Special Purpose Food Equipment and Devices

U.S. DEPARTMENT OF DEFENSE (DOD)

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

U.S. DEPARTMENT OF ENERGY (DOE)

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

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
PL 109-58	Energy Policy Act of 2005 (EPAct05)

UNDERWRITERS LABORATORIES (UL)

UL 197	(2010; Reprint Mar 2023) UL Standard for Safety Commercial Electric Cooking Appliances
UL 207	(2022) UL Standard for Safety Refrigerant-Containing Components and Accessories, Nonelectrical

UL 471	(2010; Reprint Sep 2019) UL Standard for Safety Commercial Refrigerators and Freezers
UL 489	(2016; Rev 2019) UL Standard for Safety Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
UL 763	(2018; Reprint Nov 2022) UL Standard for Safety Motor-Operated Commercial Food Preparing Machines
UL 1598	(2021; Reprint Jun 2021) Luminaires
UL Elec Equip Dir	(2011) Electrical Appliance and Utilization Equipment Directory

1.2 GENERAL REQUIREMENTS

****

NOTE: Indicate the configuration and layout for all food service equipment, with interior elevations and equipment identified by number. Show "Food Service Equipment Schedule" on the drawings using the same identification numbers as indicated in Section 11 06 40.13 FOODSERVICE 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.

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.

****

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

****

NOTE: If specifying or scheduling major equipment edit and include the following paragraph. Smaller countertop, food prep equipment specified in Section 11 42 00 FOOD PREPARATION EQUIPMENT is not ENERGY STAR labeled.

****

Provide [Major electrically or gas powered] equipment specified within this section, [and] [Section 11 41 11 REFRIGERATED AND FROZEN FOOD STORAGE EQUIPMENT.] [Section 11 44 00 FOOD COOKING EQUIPMENT,][Section 11 46 00 FOOD DISPENSING EQUIPMENT,] [Section 11 47 00 ICE MACHINES,] conforming to EPA Energy Star requirements and labeling. Special purpose equipment must conform to NSF/ANSI 169, NSF/ANSI 59, and NSF/ANSI 8.[Provide

documentation conforming to Energy Star as required in Section 01 33 29 SUSTAINABILITY REQUIREMENTS AND REPORTING.]

1.2.1 Mechanical General Requirements

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

Section 23 03 00.00 20 BASIC MECHANICAL MATERIALS AND METHODS, applies to this section. Stainless steel plumbing fixtures must conform to ASME A112.19.3/CSA B45.4

Section 23 63 00.00 COLD STORAGE REFRIGERATION SYSTEMS applies to this section.

Section 22 00 00 PLUMBING, GENERAL PURPOSE applies to this section. Coordinate the location of drainage receptacles with food preparation equipment requiring plumbing connections. All plastics and piping system components must conform to NSF/ANSI 14. Materials must conform to NSF/ANSI 51. Refrigeration equipment must conform to ANSI/ASHRAE 15 & 34, NSF/ANSI 37, NSF/ANSI 6, NSF/ANSI 7, UL 207, and UL 471.

1.2.1.1 American Gas Association Laboratories Standards

Gas-burning equipment must be designed for operation with the type of gas specified and be approved by CSA. Acceptable evidence of meeting the requirements of the applicable CSA Directory standards must be either CSA mark on equipment, a photostatic copy of the CSA appliance certificate, a listing of the specific food service equipment or appliance in the CSA Directory, or a certified test report from a nationally recognized independent testing laboratory, indicating that the specified equipment has been tested and conforms to the requirements of the applicable CSA standards.

1.2.2 Electrical General Requirements

All electrical work must conform to NFPA 70, and NEMA 250. Motors and controllers must conform to the requirements of NEMA ICS 2, NEMA ICS 6, NEMA MG 1, NEMA MG 2 and UL 763.

****
NOTE: Select one of the following agency statements.
****

Section 26 05 00.00 40 COMMON WORK RESULTS FOR ELECTRICAL, applies to this section.
Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM, applies to this system.

[1.2.3 Electromagnetic Interference Suppression

****
NOTE: Electromagnetic interference suppression is required only when there is a probability of radio frequency interference with the using activities radio communications systems.
****

Provide in accord with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

][1.2.4 Fungus Treatment of Electrical Components

****
NOTE: Fungus treatment of electrical components is required only in extremely humid and tropical climates.
****

Provide fungus treatment of all electrical components.

]1.3 DESCRIPTION OF WORK

The work includes [furnishing and] [installing] [and modifying existing] food service preparation equipment and related work. Verify all existing dimensions, contract drawings, product data and all related conditions prior to commencing rough-in work. Advise the Contracting Officer of all discrepancies prior to ordering equipment. Submit Contractor's Field Verification Data prior to the preconstruction meeting addressing the following:

a. Field verify all horizontal and vertical dimensions.

b. Review contract drawings and submittal data for accuracy and completeness.

c. Field check installed utility capacity and location.

d. Review critical systems/components for application and capacities such as for exhaust hoods, refrigeration systems,fire suppression systems, gas, water, and steam/condensate line sizes and manifold configurations.

e. Coordinate and verify delivery for access through finished openings and vertical handling limitation within the building.

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 NAVSUP41, 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. Insulated floors, including under-floor perforated drains and vent pipes.

7. Disconnect switches.

8. Electrical chases and raceways and plumbing chases.

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

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

****

Submit detail drawings for all food service and storage equipment. Drawings must be 1:50 1/4 inch scale minimum.

Submit a complete Food Service Equipment Schedule, material data, and drawings as specified. Provide detail drawings showing complete wiring, piping, and schematic diagrams, and any other details required to demonstrate that the system is coordinated and properly functions as a unit. Drawings must show proposed layout and anchorage of equipment and appurtenances, and equipment relationship to other parts of the work, including clearances for maintenance and operation.

a. Detail drawings by Contractor must be separate drawings and be the Contractor's standard sheet size, but not smaller than the contract drawings, indicating food service equipment and cold storage assemblies with itemized schedule, special conditions drawings indicating size and location of slab depressions, cores, wall openings, blockouts, ceiling pockets, blocking grounds,[ceiling,][wall,] access panels, rough-in plumbing/mechanical systems and rough-in electrical systems.

b. Prepare and submit detail drawings that show the size, type, and location of equipment drain lines, and floor drains. Indicate drain lines from equipment, distances of drain lines and floor drain receptacles from equipment and aisles, and elevation views of drain piping and floor drains.

c. Detail drawings by manufacturer must be separate drawings; manufacturer's standard size and indicate item number, name, and quantity, construction details, sections, and elevations, adjacent walls, columns, and equipment, plumbing and electrical schematics, and fabricated fixtures with single electrical or plumbing connection, and service access panels required for maintenance or replacement of mechanical or electrical components.

1.4 SUBMITTALS

****

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.

****

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[, [_____]]

Manufacturer's Qualifications; G[, [_____]]

SD-02 Shop Drawings

Detail Drawings; G[, [_____]]

Food Service Equipment Schedule; G[, [_____]]

Food Service Equipment Utilities Coordination Plan; G[, [_____]]

Custom Fabricated Equipment; G[, [_____]]

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

SD-03 Product Data

Food Service Equipment

Food Preparation Equipment

SD-04 Samples

Exterior Panel Finish Material; G[, [_____]]

Interior Panel Finish Material; G[, [_____]]

Sample Warranty; G[, [_____]]

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

National Sanitation Foundation Standards

Underwriters Laboratories Standards

Energy Star Labeled

PL 109-58 Compliant

SD-08 Manufacturer's Instructions

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

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals; G[, [_____]]

List of Authorized Local Service and Repair Entities; G[, [_____]]

SD-11 Closeout Submittals

Manufacturer's Warranty; G[, [_____]]

Contractor's Warranty for Installation; G[, [_____]]

1.5 QUALITY ASSURANCE

****

NOTE: Selected equipment must conform to efficiency requirements as defined in Public Law (PL) 109-58 - "Energy Policy Act of 2005 (EPAct05)" for energy efficiency procurement and as specified by FEMP and ENERGY STAR. Equipment selected will have as a minimum the efficiency rating determined in "Energy-Efficient Products" at http://www1.eere.energy.gov/femp/procurement.

Equipment having a lower efficiency may be specified if the designer determines the equipment to be more life-cycle cost effective. Indicate the equipment operating characteristics, including rated energy efficiency, on the drawings.

****

1.5.1 Energy Star Labeled Model List

Provide documentation certifying that products provided are PL 109-58 compliant by meeting or exceeding Energy Star or FEMP efficiency requirements as defined at "Energy-Efficient Products at http://www1.eere.energy.gov/femp/procurement. Indicate Energy Efficiency Rating. Custom fabricated items, which do not bear the Energy Star label must be accompanied by energy efficiency data and submitted to the Contracting Officer for review.

1.5.2 National Sanitation Foundation Standards

Provide acceptable evidence of meeting the requirements of the applicable National Sanitation Foundation (NSF) equipment standards as listed in NSF Food Equipment displaying the NSF seal for the year the equipment was manufactured, a certification issued for special or specific food service equipment by NSF under their special one time contract evaluation and certification, or a certified test report from an independent testing laboratory, approved by the Office of the Surgeon General, indicating that the specific food service equipment has been tested and conforms to the applicable NSF standards.

1.5.3 Standard Products

Materials and equipment must be the standard products of manufacturer regularly engaged in the manufacture of the products and be essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Applications must be for equipment and materials under similar circumstances and of similar size. When two or more of the same products are supplied they must be products of one manufacturer. Equipment must be supported by a service organization that is, in the opinion of the Contracting Officer, reasonably convenient to the site.

1.5.4 Nameplates

Provide each item of equipment bearing a stainless steel, aluminum, or engraved polyester nameplate, as standard with the manufacturer, located in a conspicuous position and permanently fastened to the equipment. Make name or identification plates the size standard with the manufacturer for the particular piece of equipment provided. Name plates must indicate the name of the manufacturer/trade name, serial number, make, and model number, pertinent ratings, operating characteristics, and other information as standard with the manufacturer, date of manufacture,

electrical characteristics, and other applicable data, such as flow rate, temperature, pressure, capacity, and material of construction. Securely fasten separate equipment identification plates with the contract number marked thereon, to the surface of each piece of equipment.

1.5.5 Underwriters Laboratories Standards

Provide electrically operated equipment in accordance with applicable UL standards UL 489 and UL 763. Provide a UL label on the equipment as evidence of meeting the requirements, including a UL listing mark per UL Elec Equip Dir or a certified test report from a nationally recognized independent testing laboratory indicating that the specific food service equipment has been tested and conforms to the applicable UL standards or equivalent OSHA Nationally Recognized Testing Laboratory (NRTL) standard.

1.5.6 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. Preconstruction Submittals:

(1) Contractor's Field Verification Data

(2) Manufacturer's Qualifications

b. Shop Drawings, product data and installation instructions

(1) Detail Drawings

(2) Food Service Equipment Schedule

Submit in the same format as the equipment schedule on the drawings. Include Energy Star labeled model list.

(3) Food service equipment utilities

(4) Custom fabricated equipment

(5) Installation Instructions and Diagrams

c. Product Data:

food preparation equipment

d. Samples

(1) Exterior panel finish material

(2) Interior panel finish material

(3) Sample Warranty

e. Design Data

(1) Manufacturer's descriptive and technical literature

(2) Manufacturer's Test Data

f. Manufacturer's Instructions

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

1.6 DELIVERY, STORAGE, AND HANDLING

Unless otherwise directed, the following procedures apply:

1.6.1 Delivery

a. Deliver field assembled fixed equipment integrated into structure to jobsite when required.

b. Deliver fixed equipment not integrated into structure to the jobsite after completion of finished ceilings, lighting, and acidizing of the finished floor and wall systems, including painting.

c. Deliver major movable equipment to inventory in a secured area for interim jobsite storage, or if secured area is not available, when fixed equipment installation/clean-up has been completed.

d. Deliver minor appliances and loose items to the jobsite when the Contracting Officer is prepared to receive and inventory such items.

1.6.2 Storage of Equipment and Accessories

Store delivered items with protection from weather, humidity, and temperature variation, dirt and dust, or other contaminants. Clearly label and identify all components with respective number as enumerated in approved Food Service Equipment Schedule.

1.6.3 Protection of Fixed/Fabricated Manufactured Equipment

Follow equipment manufacturer's recommendations to protect materials and equipment and prevent damage.[Tape fiberboard or plywood to surfaces as required by equipment shape and installation access requirements. Do not use tape which may possibly damage finished surface.]

1.6.4 Prohibited Use of Equipment

Do not use food service equipment as tool or material storage, work bench, scaffold, or stacking area.

1.6.5 Damaged Equipment

Immediately submit documentation to the Contracting Officer with a recommendation of action for repair or replacement and the impact on project schedule.

PART 2 PRODUCTS

2.1 MATERIALS

Food equipment must conform to OSHA standards 29 CFR 1910.144, 29 CFR 1910.145, 29 CFR 1910.212, 29 CFR 1910.306, and related NSF and UL standards

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

Comply with EPA sustainable acquisition (SA) requirements in accordance with Section 01 33 29 SUSTAINABILITY REQUIREMENTS AND REPORTING; regarding insulation materials for all equipment designated within this section. Other materials must conform to the following:

2.1.1 Stainless Steel, Sheets and Formed, Nonmagnetic

ASTM A480/A480M or ASTM A240/A240M: 18-8, 300 Series, austenitic, polished to [No. 3 or]No.4 finish on exposed surfaces.

2.1.2 Stainless Steel Pipe, Tubing and Bars

ASTM A269/A269M, ASTM A270/A270M, ASTM A666. Provide seamless or welded pipe and tubing, of the gauge specified, of true roundness, and of material as specified for stainless steel. Seamless tubing must be thoroughly annealed, pickled, and ground smooth. Welded tubing must be thoroughly heat-treated, quenched to eliminate carbide precipitation and then drawn true to size and roundness, and ground. Provide No. 3 or 4 finish tubing when exposed to view.

Provide bars conforming to ASTM A276/A276M, ASTM A666, Type 302 or Type 304 or Type 316.

2.1.3 Galvanizing Repair Compound

ASTM D520, Type I pigment.

2.1.4 Brazing and Braze Welding Material

AWS A5.8/A5.8M, class as applicable.

2.1.5 Steel Structural Shapes for Framing

ASTM A36/A36M. Provide uniform structural shapes, ductile in quality, and of hard spots, runs, checks, cracks and other surface defects. Galvanize sections by the hot-dip process, conforming to ASTM A123/A123M.

2.1.6 Coatings

Provide durable, nontoxic, nondusting, nonflaking, and mildew-resistant type coatings, suitable for use with food service equipment and in conformance with NSF/ANSI 2. Application must be in accordance with the recommendations of the manufacturer.

2.1.6.1 Exterior Parts

Exterior, galvanized parts, exposed members of framework, and wrought steel pipe, where specified to be painted, must be cleaned, and free of foreign matter before applying a rust inhibiting prime and two coats of epoxy-based paint in accordance with Section 09 90 00 PAINTS AND COATINGS, unless otherwise specified. Color will be selected by the Contracting Officer from manufacturer's standard colors.

2.1.6.2 Chromium Plating

Apply chromium plating over nickel plating.

2.1.7 Zinc-Coated Steel

2.1.7.1 Sheets and Shapes

Provide zinc coated sheets conforming to ASTM A653/A653M, coating Class Z275 G90. Provide zinc coated shapes conforming to ASTM A36/A36M, in accord with ASTM A123/A123M.

2.1.8 Brass Piping and Fittings

Pipe must conform to ASTM B43. Fittings must conform to ASME B16.15.

2.1.9 Copper Tubing and Fittings

Provide copper tubing conforming to ASTM B88M ASTM B88, Type K, annealed, for buried or embedded in concrete installation and Type L, hard drawn, for above grade installation. Fittings must conform to ASME B16.18, above grade, ASME B16.22 or ASME B16.26, above or below grade.

2.1.10 Solder Material

ASTM B32, Sn96.

2.1.10.1 Lead-Free Solder

ASTM B32, 95.5 tin-antimony solder or other "lead-free" solder. Use for all potable water copper tubing and fitting connections, and for solder joints in contact with food.

2.1.10.2 Tin-Lead Solder

ASTM B32, alloy grade 50B for temperatures up to 65 degrees C 150 degrees F and alloy grade 95TA for temperatures over 65 degrees C 150 degrees F.

2.1.10.3 Silver Solder

AWS A5.8/A5.8M, 15 percent silver base brazing alloy, melting point not less than 540 degrees C 1000 degrees F.

2.1.11 Laminated Plastics

ANSI/NEMA LD 3 and NSF/ANSI 35.

2.1.12 Sealants

Sealants must conform to the requirements of ASTM C1330, ASTM C920.

2.2 CONSTRUCTION OF FABRICATED EQUIPMENT

2.2.1 Grinding, Polishing, and Finishing

Grind smooth all exposed welded joints and finish to match the adjoining material. Wherever materials have been depressed or sunken by welding operation, hammer and peen such depressions flush with the adjoining surface, and again grind to eliminate high spots. Polish and buff ground surfaces to match adjoining surfaces. Exercise care in the grinding operations to avoid excessive heating of the metal and metal discoloration. Abrasives, wheels, and belts used in grinding must be free

of iron and not previously used on carbon steel. In all cases, the grain of rough grinding must be removed by several successively finer polishing operations. Final polishing operation must be uniform, smooth, and consistent. Make the grain direction of horizontal stainless steel surface longitudinal, including the splash back. Provide a mitered appearance when polishing at right angle corners. Provide close fit butt and contact joints not requiring solder as a filler. Wherever brake bends occur, the bends must be free of open texture or orange peel appearance. Where brake work does mar the uniform appearance of the material, remove such marks by grinding, polishing, and finishing. Make sheared edges free of burrs, projections, and fins. Where miters or bullnosed corners occur, finish such miters and corners with the underage of the material and grind to a uniform condition. Overlapping of material is not acceptable. Provide [No. 3][or][4][XL][XL Buff] finish for all exposed stainless steel surfaces. Finishes of materials, other than stainless steel, must be comparable in appearance to commercial mill finish. Exposed surfaces include:

a. Exterior surfaces exposed to view.

b. Interior surfaces exposed to view in doorless cabinets.

c. Undersides of shelves with a ground finish of No. 90 grit or finer.

2.2.2 Fastening Devices

Provide fastening devices of the same material as the metal being joined when joint pieces are of similar metal. Fastening devices must be stainless steel, ASTM A666 when stainless steel is joined to dissimilar metal. Provide minimum M6 1/4-20 stainless steel stud bolts with length necessary to accept washers, and required nuts, and weld 225 mm 9 inches on center maximum. Exposed surfaces of equipment must be free of bolts, screws, and rivet heads. Use stainless steel stud bolts to fasten tops of counters or tables to angle framing and trim to other surfaces. Such bolts must be the concealed type. Cap threads of stud bolts which are on the inside of fixtures and are either visible or might come in contact with a wiping cloth, with chrome plated washers, lock washers, and chromium-plated brass cap nuts. Wherever bolts are welded to the underside of trim or tops, uniformly finish the reverse side of the welds with the adjoining surface of the trim or the top. Dimples at these points are not be acceptable.

2.2.3 Welding

2.2.3.1 Welds

Use tungsten inert gas process. Use filler metal compatible with the material being welded. Do not use carbon arc welding on tops of counters, tables, drainboards, exposed shelving, or sinks. Make welds ductile and of same color as adjoining surfaces.

2.2.3.2 Welding Rods

Perform all welding with welding rods of the same composition as the sheets or parts welded. Factory weld long section components to the greatest lengths possible to minimize field welded joints.

2.2.3.3 Weld Quality

Weld quality must conform to the requirements of AWS A5.8/A5.8M, AWS D1.1/D1.1M, AWS D10.4 and AWS D9.1/D9.1M. Factory weld long section components to the greatest lengths possible to minimize field welded joint.

2.2.4 Built-in Equipment Lighting

Built-in lighting must conform to UL 1598.

2.2.5 Sound Deadening of Counters and Sinks

Provide sound deadening for counter tops and sinks with 13 mm 1/2 inch wide rope sealant positioned continuously between all contact surfaces of the frame-members and the underside of counter top, overshelves and undershelves. Tighten stud bolts for maximum compression and trim any excess sealant.

2.2.6 Heat Lamp/Display Wiring

Conceal heat lamp/display wiring in corner post(s).

2.2.6.1 Heat Lamps

Provide heat lamp units with consolidated chassis of longest possible length for multiple sections. Include integral incandescent display light with warm white lamps and wire to a recess mounted infinitely adjustable heat control with pilot light for each separate section. Tightly secure heat lamps to the underside of the serving shelf and provide a "USDA" approved heat protector between the heat lamps and the shelf. Maximum allowable temperature at the top of a serving shelf must not exceed 49 degrees C 120 degrees F.

2.2.6.2 Display Light Modules

Provide Energy Star Labeled under-cabinet, shelf-mounted fixtures (not included with heat lamps) in 450 mm 18 inch and 900 mm 36 inch increments. Wire fixtures to a single recess mounted master switch per serving shelf.

PART 3 EXECUTION

3.1 INSTALLATION

Do not install building construction materials that show visual evidence of biological growth.

Prior to commencement of installation, perform a complete walk down of the facility with the Contracting Officer to verify readiness for installation.

Provide adequate protection of all finished surfaces, fixtures,[furnishings] and other equipment to prevent any damage during the installation work.

Conduct installation procedures conforming to applicable NSF, OSHA and UL standards specified, and the manufacturer's instructions.

[Set floor mounted equipment on 150 mm 6 inches thick concrete housekeeping pads, complete with anchor bolts and grouting. Finish

housekeeping pads with two coats of oil-resistant epoxy polyamide coating.]Set all 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.

No drilling, cutting, burning, or welding of structural parts of building is permitted. Provide access panels for concealed valves, vent controls, and control devices and items requiring periodic operation, inspection, or maintenance.

3.1.1 Equipment Connections

Complete equipment connections for all utilities. Unless otherwise specified, provide [chromium-plated copper alloy] [stainless steel] exposed piping. Provide access panels of sufficient size and so located that concealed items may be serviced and maintained or removed and replaced.

[3.1.2 Backflow Preventers

****
NOTE: Clearly indicate on the drawings all locations where backflow preventers are required.
****

Furnish and install backflow preventers as specified in Section 22 00 00 PLUMBING, GENERAL PURPOSE. The Contractor is responsible to install backflow preventers as shown on the contract drawings and at all other locations necessary to preclude a cross-connect or interconnect between a potable water supply and any source of nonpotable water, or other contaminant. Install backflow preventers at all locations where the potable water outlet is below the flood level of the equipment, or will be located below the level of the contaminant. Provide backflow preventers of sufficient size to allow unrestricted flow of water to the equipment, and preclude the backflow of waste or other contamination into the potable water system.

]3.1.3 Gas Equipment

Installation of gas operated equipment must conform to NFPA 54. Fasten a heavy duty steel cable, 75 to 150 mm 3 to 6 inch shorter than the equipment connector, to the equipment and the walls.

3.1.4 Electrical Work

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

3.1.4.1 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.

3.1.4.2 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.

3.1.4.3 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 and counter appliances mounted on mobile stands must have cord/cap assembly with cord-hanger as provided by the manufacturer.

3.1.4.4 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.

3.1.4.5 Motors

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

3.1.4.6 Heating Elements

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

3.1.4.7 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.

3.1.4.8 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.

3.1.4.9 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.

3.1.4.10 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.

3.1.5 Plumbing Work

Tag all plumbing final connection points of equipment, indicating item number, name of devices or components, and type of utility (water, gas, steam, drain). Provide extensions of indirect waste fitting to open-sight hub drain, floor sink or floor drains from food service equipment.

3.1.5.1 Steam Connection Provisions

Provide all steam-injected equipment with a steam inlet globe control valve with cold handle, relief valve, strainer, condensate gate valve, bucket steam trap, and swing check valve. Compartment steam cookers must have piping manifolded from all compartment exhaust valves to a floor drain, floor sink, or drain trench. Provide steam generators specified within this section with automatic boiler blowdown and a cold water condenser. Separate equipment, devices or components indicated to be connected to a steam-generator, provided under this section, must be provided with all unions, ells, gate valves, nipples, brackets, clamps, etc., required for the complete operating system for final connection.

Steam supply piping must be insulated with 25 mm 1 inch fiberglass insulation (48 kg/cubic meter3 pounds/cubic foot density) and have factory-applied fire retardant. Install a full-length 1.6 mm 16 gauge stainless steel pipe enclosure with sloping top, jacket, and vapor barrier over steam lines.

3.2 MANUFACTURER'S FIELD SERVICES

Furnish manufacturer's representatives who are directly employed by the equipment manufacturers and trained to perform the services specified. The manufacturers representatives must provide advice and services on the following matters:

Starting equipment and training Government personnel as to its proper care, operation, maintenance and safety procedures.

3.3 LOCATIONS AND CLEARANCES

Locate equipment to provide working space for necessary servicing such as shaft removal, disassembling, replacing or adjusting drives, motors, or shaft seals, access to water heads and valves of shell and tube equipment, tube cleaning or replacement, access to automatic controls, lubrication, oil draining and working clearance.

3.4 IDENTIFICATION TAGS AND PLATES

Provide equipment with tags numbered and stamped for their use as indicated on the Food Service Equipment Schedule. Provide brass or non-ferrous plates and tags. Minimum letter and numeral sizes are 3.18 mm 1/8 inch high.

3.5 OPERATION AND MAINTENANCE MANUALS

Submit six copies of operating instructions outlining the step-by-step procedures required for equipment start-up, operation and shutdown. Include the manufacturer's name, model number, service manual, parts list, and a brief description of equipment and basic operating features.

Submit [6][_____] copies of maintenance manuals listing routine maintenance procedures, possible breakdowns and repairs, trouble shooting guides, and containing the following:

a. Front and rear protective covers with labeled project name.

b. Index indicating item number, quantity, description, manufacturer's name, and model number.

c. Maintenance instructions for stainless steel and plastic laminate.

d. Manufacturer's catalog specification sheets and manufacturer's detail and control drawings.

e. Manufacturer's operation manual outlining the step-by-step procedures for equipment installation, startup, basic operation features, and operation shutdown.

f. Manufacturer's maintenance manual listing routine maintenance procedures, possible breakdowns, repairs, and troubleshooting guides. Include simplified diagrams for the equipment as installed.

g. Manufacturer's list of parts and supplies with current unit price and address of manufacturer's parts supply warehouse.

Include simplified wiring diagrams in the instructions. Framed instructions under glass or in laminated plastic, including wiring and

control diagrams showing the complete layout of the entire system, must be posted where directed. Prepare in typed form, condensed operating instructions explaining preventative maintenance procedures, methods of checking the system for normal safe operation, and procedures for safely starting and stopping the system, framed as specified above for the wiring and control diagrams, and posted beside the diagrams. Submit proposed diagrams, instructions, and other sheets, prior to posting. Post the framed instructions, including wiring and control diagrams, before acceptance testing of the systems.

3.6 INSTRUCTIONS TO GOVERNMENT PERSONNEL

Prepare and conduct a training course for the operating staff as designated by the Contracting Officer. The training must consist of a total [_____] hours of normal working time and start after the system is functionally completed but prior to final acceptance tests. Cover in the field instructions the items contained in the operating and maintenance instructions, as well as demonstrations of routine maintenance operations. Notify the Contracting Officer at least [14][_____] days prior to date of proposed conduction of the training course.

Submit a list of authorized local service and repair entities to the Contracting Officer 14 days prior to conducting the training course.

3.7 TESTS

Perform the tests including everything required. Notify the Contracting Officer, in writing, [10][_____] days before performing tests. Perform tests in the presence of [a manufacturer's representative][and Contracting Officer].

3.7.1 Initial Start-Up and Operational Test

Provide all lubricants and accessories before initial start-up. Start and operate all equipment. Follow the manufacturer's procedures and place the systems under all modes of operation. Supplement initial charges of lubricating oil to assure maximum operating capacity. Adjust all safety and automatic control instruments. Record manufacturer's recommended readings hourly. Operational tests must cover a period of not less than [3][5][_____] days.

3.7.2 Test Reports

Submit the final field test reports for each system tested, describing test apparatus, instrumentation calculations, and equipment data based on industry standard forms or reasonable facsimiles thereof. Data must include: compressor suction and discharge pressure; refrigerant charge pump, compressor and air moving device ampere readings; power supply characteristics, including phase imbalance, with 1/2 percent accuracy; thermostatic expansion valve superheat-value as determined by field test; subcooling; high and low refrigerant temperature switch set-points; low oil pressure switch set-point; [defrost system timer and thermostat set-points;] moisture content; ambient, condensing and coolant temperatures; capacity control set-points; field data and adjustments which affect unit performance and energy consumption. Where final adjustments and settings cannot be permanently marked or drilled and pinned as an integral part of device, include adjustment and setting data in test report.

3.7.3 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.

3.8 MANUFACTURER'S WARRANTY

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

3.9 CONTRACTOR'S WARRANTY for INSTALLATION

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

-- End of Section --