

SECTION 233813 - COMMERCIAL KITCHEN HOODS AND DUCTWORK

PART 1 - GENERAL

1.1 SUBMITTAL REQUIREMENTS

A. Product Data

1. Standard hoods.
2. Filters/baffles.
3. Fire-suppression systems.
4. Lighting fixtures.
5. Grease ducts

B. Shop Drawings

1. Signed and sealed by a qualified professional engineer.
2. Shop Drawing Scale: 1/4 inch = 1 foot
3. Show plan view, elevation view, sections, roughing-in dimensions, service requirements, duct connection sizes, and attachments to other work.
4. Show cooking equipment plan and elevation to confirm minimum code-required overhang.
5. Indicate performance, exhaust and makeup air airflow, and pressure loss at actual Project-site elevation.
6. Show control cabinets.
7. Show fire-protection cylinders, piping, actuation devices, and manual control devices.
8. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
9. Design Calculations: Calculate requirements for selecting seismic restraints.
10. Wiring Diagrams: Power, signal, and control wiring.
11. Piping Diagrams: Detail fire-suppression piping and components and differentiate between manufacturer-installed and field-installed piping. Include roughing-in requirements for drain connections. Show cooking equipment plan and elevation to illustrate fire-suppression nozzle locations.

1.2 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish one complete set of grease filters/baffles.

PART 2 - PRODUCTS**2.1 TYPE I EXHAUST HOOD**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Captive-Aire Systems.
 2. Accurex by Greenheck.
 3. MetalCraft.
 4. Grease Master.
- B. Weld all joints exposed to grease with continuous welds, and make filters/baffles or grease extractors and makeup air diffusers easily accessible for cleaning.
1. Fabricate hoods according to NSF 2, "Food Equipment."
 2. Hoods shall be listed and labeled, according to UL 710, by a testing agency acceptable to authorities having jurisdiction.
 3. Hoods shall be designed, fabricated, and installed according to NFPA 96.
 4. Duct Collars: Minimum 0.0598-inch- thick steel at least 3 inches long, continuously welded to top of hood and at corners
 5. Makeup Air Fire Dampers: Labeled, according to UL 555, by a testing agency acceptable to authorities having jurisdiction.
 - a. Fire Rating: 1-1/2 hours.
 - b. Frame: SMACNA Type A , with blades in airstream; fabricated with roll-formed stainless steel; with mitered and interlocking corners.
 - c. Blades: Roll-formed, interlocking or folded, minimum 0.034-inch- thick, stainless steel sheet.
 - d. Horizontal Dampers: Include a blade lock and stainless-steel closure spring.
 - e. Fusible Link: Replaceable, 212 deg F rated.
- C. Hood Configuration: Exhaust only .
1. Makeup air shall be introduced through laminar-flow-type, perforated metal panels on front of hood canopy.
- D. Hood Style: Wall-mounted canopy .
- E. Filters/Baffles: Removable, stainless-steel, with spring-loaded fastening. Fabricate stainless steel for filter frame and removable collection cup and pitched trough. Exposed surfaces shall be pitched to drain to collection cup. Filters/baffles shall be tested according to UL 1046, "Grease Filters for Exhaust Ducts," by an NRTL acceptable to authorities having jurisdiction.
- F. Lighting Fixtures: Surface-mounted, fluorescent fixtures and lamps with lenses sealed vapor-tight. Wiring shall be installed in conduit on hood exterior. Number and location

of fixtures shall provide a minimum of 70 foot candles at 30 inches above finished floor.

1. Light switches shall be mounted on front panel of hood canopy
2. Lighting Fixtures: Incandescent complying with UL 1598.

G. Hood Controls: Wall-mounting control cabinet, fabricated of stainless steel.

1. Exhaust Fan: On-off switches shall start and stop the exhaust fan. Interlock exhaust fan with makeup air supply fan to operate simultaneously. Interlock exhaust fan with fire-suppression system to operate fan(s) during fire-suppression-agent release and to remain in operation until manually stopped. Include red pilot light to indicate fan operation.

2.2 LISTED GREASE DUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ampco.
2. Captive Aire.
3. Dixie Sheetmetal.
4. Lindab.
5. Selkirk.
6. Metal-Fab

B. Description: Double-wall metal vents tested according to UL 1978 and rated for 500 deg F continuously, or 2000 deg F for 30 minutes; with positive or negative duct pressure and complying with NFPA 211.

C. Double wall metal vent systems tested according to UL 2221.

D. Material:

1. ASTM A 666, Type 304 stainless steel. Comply with ASTM A 480, Type 302, 304, or 316; with No. 4 finish where exposed to view in occupied spaces, No. 1 finish elsewhere. Protect finished surfaces with mill-applied adhesive protective paper, maintained through fabrication and installation. Minimum gauge shall be 24.
2. ASTM A 1008 carbon steel sheets with oiled, matte finish for exposed ducts.
3. ASTM B 209 Aluminum alloy 3003, H14 temper with mill finish for concealed ducts and standard, one-side bright finish for duct surfaces exposed to view.

E. Insulation: Minimum 3" thick soluble ceramic fiber between inner and outer walls.

F. Accessories: Tees, elbows, increasers, hood connectors, terminations, adjustable roof flashings, storm collars, support assemblies, thimbles, firestop spacers, and fasteners; fabricated from similar materials and designs as vent-pipe straight sections; all listed for

same assembly. Include unique components required to comply with NFPA 96 including cleanouts, transitions, adapters and drain fittings.

2.3 WET-CHEMICAL FIRE-SUPPRESSION SYSTEM

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Ansul Incorporated; a Tyco International Ltd. Company.
 2. Badger Fire Protection.
 3. Kidde Fire Systems.
 4. Pyro Chem.
- B. Description: Engineered distribution piping designed for automatic detection and release or manual release of fire-suppression agent by hood operator. Fire-suppression system shall be listed and labeled for complying with NFPA 17A, "Wet Chemical Extinguishing Systems," by a qualified testing agency acceptable to authorities having jurisdiction.
1. Steel Pipe, NPS 2 and Smaller: ASTM A 53/A 53M, Type S, Grade A, Schedule 40, plain ends.
 2. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300.
 3. Piping, fusible links and release mechanism, tank containing the suppression agent, and controls shall be factory installed. Controls shall be in stainless-steel control cabinet mounted on wall. Furnish manual pull station for wall mounting. Exposed piping shall be covered with chrome-plated aluminum tubing. Exposed fittings shall be chrome plated.
 4. Liquid Extinguishing Agent: Noncorrosive, low-pH liquid.
 5. Furnish electric-operated gas shutoff valve with clearly marked open and closed indicator and manual reset for field installation.
 6. Fire-suppression system controls shall be integrated with controls for fans, lights, and fuel supply and located in a single cabinet for each group of hoods immediately adjacent.
 7. Wiring shall have color-coded, numbered terminal blocks and grounding bar. Spare terminals for fire alarm, optional wiring to start fan with fire alarm, red pilot light to indicate fan operation, and control switches shall all be factory wired in control cabinet with relays or starters. Include spare terminals for fire alarm, and wiring to start fan with fire alarm.
- C. Provide all necessary switches, emergency gas valves, control wiring and two sets of normally open / normally closed contacts for interface with the gas valve and fire alarm system.

PART 3 - EXECUTION

3.1 INSTALLATION OF KITCHEN HOODS

- A. Complete field assembly of hoods where required.
 - 1. Make closed butt and contact joints that do not require filler.
 - 2. Grind field welds on stainless-steel equipment smooth, and polish to match adjacent finish. Comply with welding requirements in Part 2 "General Hood Fabrication Requirements" Article.
- B. Make cutouts in hoods where required to run service lines and to make final connections, and seal openings according to UL 2221.
- C. Install trim strips and similar items requiring fasteners in a bed of sealant. Fasten with stainless-steel fasteners at 48 inches o.c. maximum.
- D. Install sealant in joints between equipment and abutting surfaces with continuous joint backing, unless otherwise indicated. Provide airtight, watertight, vermin-proof, sanitary joints.
- E. Install lamps, with maximum recommended wattage, in equipment with integral lighting.
- F. Set field-adjustable switches.

3.2 INSTALLATION OF TYPE 1 EXHAUST DUCTS

- A. Fabricate kitchen exhaust ducts and supports, used for smoke and vapor removal from cooking equipment, of 16-gage minimum carbon steel where concealed, and of 18-gage minimum stainless steel where exposed. For duct construction, comply with SMACNA "HVAC Duct Construction Standards", and NFPA 96 "Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment".
- B. Fabricate joints and seams with continuous welds for watertight construction. Provide for thermal expansion of ductwork through 2000 deg. F temperature range.
- C. Install without dips or traps which may collect residues, except where traps have continuous or automatic residue removal. Pitch ducts per UL requirements to drain grease back to hood.
- D. Provide access openings at duct connection to hood and at each change in direction, located on sides of duct 1-1/2" minimum from bottom, and fitted with grease-tight covers of same material as duct. Install additional access openings at a maximum spacing of 12 feet along duct runs.

- E. Where vertical exhaust ductwork spans multiple floors, provide access openings from every floor into the duct riser if personnel access to the interior of the vertical duct is unachievable.
- F. Strip protective paper from stainless ductwork surfaces, and repair finish wherever it has been damaged.
- G. Provide a manual reset fire stat mounted in the exhaust duct above the hood for automatic shutdown of hood exhaust fan. Wiring by electrical contractor.

END OF SECTION 233813