

**SECTION 23 3813**  
**COMMERCIAL-KITCHEN HOODS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Cooking hoods.
- B. Condensate (dishwashing) hoods.

**1.02 RELATED REQUIREMENTS**

- A. Section 10 4400 - Fire Protection Specialties: Hand held fire extinguishers.
- B. Section 11 4000 - Foodservice Equipment: General provisions for hoods.
- C. Section 11 4001 - Custom Fabricated Foodservice Equipment.
- D. Section 21 1300 - Fire Suppression Sprinklers: Connection of hood fire extinguishing system to sprinkler system.
- E. Section 22 1006 - Plumbing Piping Specialties: Floor drains for indirect discharge.
- F. Section 22 1006 - Plumbing Piping Specialties: Electrically-operated gas valve for cooking equipment.
- G. Section 23 3100 - HVAC Ducts and Casings: Exhaust and make-up air ducts.
- H. Section 23 3416 - Centrifugal HVAC Fans: Kitchen exhaust fans.

**1.03 REFERENCE STANDARDS**

- A. ASSE 1001 - Performance Requirements for Atmospheric Type Vacuum Breakers; 2008.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- C. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2014.
- D. NSF 2 - Food Equipment; 2014.
- E. SMACNA (KVS) - Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines; 2001.
- F. UL 710 - Standard for Exhaust Hoods for Commercial Cooking Equipment; Current Edition, Including All Revisions.
- G. UL 1046 - Standard for Grease Filters for Exhaust Ducts; Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation instructions, adjusting and balancing methods.
- C. Shop Drawings: For each custom fabricated unit, provide drawings showing details of construction, dimensions, and interfaces with adjacent construction.
- D. Test Reports for Grease Extracting Hoods: Provide test reports substantiating exhaust volume ratings and grease extraction performance.
- E. Operation and Maintenance Data.
- F. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.

2. Extra Detergent for Water Wash System: 5 gallons.

### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications:
  1. At least five years experience in the design and manufacture of products of similar type to those specified.
  2. For grease extracting hoods, able to provide test data showing performance of hoods to be provided.
  3. Having at least one factory-authorized service agency located within 50 miles of project site.
  4. Able to provide service to project site within 24 hours after receiving a service call.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Grease Extracting Hoods:
  1. Greenheck Fan Corporation; \_\_\_\_\_: www.greenheck.com.
  2. Halton, Halton Food Service Group; \_\_\_\_\_: www.halton.com.
  3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Other Hoods:
  1. Same manufacturer as for grease extracting hoods.

### **2.02 HOOD APPLICATIONS**

- A. Canopy-Style Cooking Hoods Type \_\_\_\_:
  1. Style: Double island canopy.
  2. Type: Grease extracting type, with water wash system.
  3. Mounting Height: Bottom rim at \_\_\_\_ inches above finished floor.
- B. Pass-Over or Serve-Over Cooking Hoods Type \_\_\_\_: For cooking equipment at serving line pass-throughs.
  1. Type: Grease extracting type, with water wash system.
  2. Mounting Height: Bottom rim at \_\_\_\_ inches above finished floor.
- C. Non-Canopy-Style Cooking Hoods Type \_\_\_\_: Wall-attached and appliance-attached.
  1. Type: Grease extracting type, with water wash system.
  2. Mounting Height: Bottom rim at 36 inches above finished floor.
- D. Dishwashing Machine Hoods Type \_\_\_\_: Custom-fabricated condensate hood to fit machine.
  1. Make-up and exhaust ducts extending 6 inches above ceiling for connection by others.
  2. Hood Configuration and Size: As indicated on the drawings.
- E. Condensate Hoods Type \_\_\_\_:
  1. Style: Island canopy.
  2. Mounting Height: Bottom rim at \_\_\_\_ inches above finished floor.

### **2.03 HOOD CONSTRUCTION**

- A. Provide products that comply with NFPA 96, the requirements and recommendations of SMACNA (KVS), and the requirements of the Authorities Having Jurisdiction.
- B. Cooking Hoods: Provide Type I hoods, with all external joints and seams continuously welded, liquid-tight, and all internal joints, seams, and attachments sealed liquid-tight and grease-tight.
  1. Provide fire extinguishing system for all cooking hoods.
  2. Provide complete assemblies listed and labeled by UL under UL 710 for its intended use.
  3. Provide hoods and exhaust ducts rated for zero clearance to combustible construction.
  4. Provide complete assemblies certified and labeled by NSF under NSF 2.
- C. Condensate Hoods: Provide Type II hoods with all joints and seams liquid-tight.
  1. Inside the bottom perimeter provide an integral formed condensate gutter:

2. Gutter Dimensions: 3 inches wide with one inch flange turned up at 45 degree angle.
  3. Drain: Stainless steel, one inch diameter, located in back corner of gutter.
  4. Pipe drain to nearest sink drainboard or floor drain.
  5. Provide complete assemblies certified and labeled by NSF under NSF 2.
- D. Construction: Materials, inside and out, are stainless steel complying with ASTM A666, Type 304, stretcher leveled; unless otherwise indicated.
1. Sheet Thickness: 18 gage, 0.048 inch, minimum.
  2. Fabrication: Fabricate each individual hood in one piece, with all welds ground and finished to match (inside and out); fabricate flat surfaces exposed to view as double-pan formed panels with internal stiffener members.
  3. Finish on Surfaces Exposed to View: No.4 (brushed directional); provide stainless steel faces on all sides exposed to view.
  4. Finish on Concealed Surfaces: No.4 or No.2B (dull, matte).
  5. Multiple Hoods: Where total hood length in one run is over 12 feet, provide multiple hoods, complete in all respects, of the largest size available and of approximately equal length, mounted end to end.
    - a. Provide junction boxes for field interconnection of wiring.
    - b. Provide pre-drilled holes for field connections, with stainless steel fasteners; if field welding is necessary, grind and polish welds to match adjacent finish.
  6. Duct Collars: For exhaust and make-up air openings, provide duct collar welded to hood unit; minimum of 8 inches extension from top or back face of unit, with minimum one inch 90 degree flange, unless otherwise indicated.
  7. Access Panels: Provide removable or hinged access panels sufficient for maintenance and replacement of operating components inside unit; maximum width of 40 inches.
  8. Electrical: Run electrical wiring in conduit or raceways, factory pre-wired, with single connection point per hood.
  9. Supports: Stainless steel mounting brackets, struts, and threaded hanger rods.
    - a. Hanger Rods: 3/8 inch diameter, minimum.
    - b. Hanger Spacing: 48 inches on center, maximum.
    - c. Attachment to Structure: Mechanical fittings or inserts, stainless steel.
  10. Accessory Panels: Where indicated, provide filler and closure panels of same construction as hoods, to close spaces between hoods and adjacent construction; mount with panel face flush with face of hood.
    - a. Where top of ceiling hung hood is lower than the finished ceiling, provide panels to close space between top of hood and ceiling.
    - b. Where back of hood must be set away from wall, provide filler panels to close space between hood and wall.
- E. Exhaust Air Volume Control: For balancing; provide either built-in volume control damper or separate damper in exhaust duct.
- F. Make-Up Air System: Provide volume damper at inlet, accessible for balancing.
1. Diffusers: Louvered register with opposed blade dampers.
  2. Plenum: Insulated with one inch thick foil-face fiberglass insulation, on inside of plenum.
- G. Fire Dampers: All stainless steel, positive closing with fully-enclosed spring assist.
1. Reset Handle: Reset after actuation by pull handle located not more than 84 inches above finished floor and not requiring removal of access panel.
  2. Fail-safe actuation by fusible link rated at 286 degrees F.
  3. Additional actuation as specified.
  4. Provide fire dampers at exhaust outlets and make-up air inlets.

#### **2.04 GREASE EXTRACTING HOODS**

- A. Grease Extracting Hoods: Pre-engineered, factory-fabricated standard products; high-velocity centrifugal grease extraction without requiring filters, cartridges, moving parts, removable parts, or constantly running water, with grease collected in gutter piped to drain, and as specified above.

1. Performance: Remove 95 percent of extraneous matter in air stream at rated air velocity; provide substantiation.
  2. Pass-Over Hoods at Serving Lines: Designed to prevent carbonization of grease in exhaust plenum.
  3. Grease Extracting Baffles: Non-removable, adjustable for balancing.
  4. Access Panels: Provide removable panels, with handles, for access to exhaust plenum for cleaning.
  5. Label: Provide permanent label indicating rated exhaust performance.
- B. Internal Water Wash System: Hot water spray to wash down all interior surfaces of entire exhaust plenum; collect wash water inside hood and pipe to point indicated for indirect connection to building drainage system.
1. Water Temperature: 140 degrees F.
  2. Water Pressure: 40 psi.
  3. Detergent: Inject or pump detergent into wash water lines.
  4. Supply Plumbing: Brass or stainless steel spray heads or nozzles and stainless steel distribution manifolds; factory installed, with one connection point per hood.
  5. Drain Plumbing: Drain fittings welded to bottom of plenum; interconnect multiple hoods for single drain connection.
- C. Plumbing Equipment: Include the following in control panel:
1. Water solenoid valve.
  2. Pressure reducing valve, if supply exceeds 50 psi.
  3. Shutoff valve, ball type.
  4. Check valve.
  5. Line strainer.
  6. Temperature/pressure gage.
  7. Shock absorber.
  8. Vacuum breaker, ASSE 1001, in water supply line between control panel and hood.
  9. Detergent pump or injector; pump test switch.
  10. Detergent inlet with check valve.
  11. Detergent reservoir; minimum one gallon capacity.
  12. Wash controls.
- D. Control Panel: Provide a single enclosure for all plumbing components, wash controls, and fan controls for a particular hood.
- E. Wash Controls:
1. Provide cleaning cycle duration timer; adjustable between 0 and 15 minutes.
  2. Shut off fan(s), if running, before starting cleaning cycle.
  3. Start wash cycle upon actuation of exhaust fire damper.
  4. Manual Actuation: Provide pushbuttons on control panel.
  5. Timed Actuation: Provide solid state, programmable controls with 24-hour, 7 day clock to set cleaning cycle duration and interval and fan on and off times.
  6. Automatic Actuation: In case of fire.
  7. Wash Zones: Provide controls capable of controlling up to 5 wash zones independently with minimum of three programmable auxiliary outputs to control user-specified devices.
  8. Provide indicator lights on control panel door indicating status of wash cycle.

## **2.05 HOOD ACCESSORIES**

- A. Fire Extinguishing System: Comply with NFPA 96.
1. Exposed Piping Under Hood: Stainless steel or chrome plated.
  2. Exposed Piping Outside Hood: Not permitted.
  3. Nozzles: Stainless steel or chrome plated brass.
  4. Electrical Components: Provide all components required for properly operating system, including but not limited to wiring, raceways, contactors, circuit breakers, switches and solenoids.

5. Fire Alarm System: Provide connection point for building fire alarm system capable of signaling system readiness and to generate signal when system is actuated.
  6. Manual Actuators: Wall-mounted pull stations; provide one near each hood and one near exit door.
- B. Controls:
1. Fans: Provide manual push button controls for starting and stopping fans and labeled indicator lights showing fan status.
  2. Fans: Provide controls for fan operation by building BAS.
  3. Cooking Equipment: Provide manual shutoff and reset button located where indicated; combine with fire extinguishing actuation.
  4. Fire Dampers: Provide thermostatic actuation of fire damper at 350 degrees F air temperature in exhaust duct; upon actuation of fire damper, automatically:
    - a. Shut off fans serving that hood.
    - b. Shut off fuel source to equipment under hood; actuate solenoid gas valves provided as part of gas piping work.
    - c. Shut off electric power to equipment under hood; actuate contactors or switches provided as part of electrical work.
    - d. Initiate automatic wash system and continue operation for 5 minutes after temperature falls below actuation temperature.
    - e. Signal building fire alarm system; normally-open contacts.
  5. Fire Extinguishing System: Provide automatic actuation complying with NFPA 96; provide local and remote manual actuating stations clearly labeled "Hood Fire Protection"; upon actuation of fire extinguishing system, automatically:
    - a. Shut off fans serving that hood.
    - b. Shut off fuel source to equipment under hood; actuate solenoid gas valves provided as part of gas piping work.
    - c. Shut off electric power to equipment under hood; actuate contactors or switches provided as part of electrical work.
    - d. Signal building fire alarm system; normally-open contacts.
  6. Internal Water Wash System: Provide interlock to shut off fan(s) prior to starting wash cycle; provide wash controls as specified.
- C. Control Panels: Factory assembled and pre-wired, ready for utility connections.
1. UL listed for use with specific hood.
  2. Provide a single control panel combining all control functions for a particular hood, unless otherwise indicated.
  3. Provide a single control panel for each group of hoods served by a single exhaust fan.
  4. Enclosures: Flush-mounted; stainless steel, to match hood.
  5. Provide indicator lights on control panel door showing status of fans and power supply.
- D. Lights Inside Hoods: LED in quantity and locations indicated, in UL listed vapor-proof fixtures, pre-wired to junction box on top of hood.
1. Locate switch for operating lights in locations indicated.
- E. Grease Filters: Stainless steel, washable, complying with UL 1046, UL listed and labeled;
- F. Exhaust Ducts: 18 gage, 0.048 inch stainless steel sheet, ASTM A666; with external seams welded continuously, liquid-tight; see drawings for extent, location, and size of exhaust ducts.
1. Where ducts penetrate ceilings or walls, provide stainless steel angle flange trim with welded corners, 16 gage, 0.06 inch minimum thickness.
  2. Where ducts penetrate hood body, provide stainless steel angle flange trim with welded corners and seal joints liquid-tight.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that overhead supports are installed in correct locations.
- B. Do not begin installation until substrates have been properly prepared.

- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions and NFPA 96.
- B. Install hoods level and plumb, securely fastened, with seismic restraints as specified, and free of vibration during normal operation.
- C. Weld hood duct collars to ductwork, liquid-tight.
- D. Connect to utilities.

### **3.04 SYSTEM STARTUP**

- A. Obtain the services of the manufacturer's representative experienced in the installation, adjustment, and operation of the equipment to supervise the starting and adjusting of equipment.
- B. Prepare equipment for startup, start and operate equipment for sufficient period to verify proper operation; correct equipment not operating correctly.
- C. Adjust volume dampers as required for proper air flow after building air handling systems have been balanced and adjusted.
- D. Demonstrate operation to Owner's designated personnel.
- E. Demonstrate operation to authorities having jurisdiction if required by them; comply with their requirements for demonstration.
- F. Report deficiencies in writing to Architect.

### **3.05 CLOSEOUT ACTIVITIES**

- A. See Section 01 7900 - Demonstration and Training, for additional requirements.
- B. Conduct training of Owner's designated personnel in the operation and maintenance of equipment.
- C. Perform at least 2 hours of training, for minimum of 2 people, at project site.
- D. Arrange training sessions with Owner at least 2 weeks in advance.
- E. Have operation and maintenance data on hand for training sessions.

### **3.06 CLEANING**

- A. Clean surfaces of equipment.

### **3.07 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION 23 3813**