



Cooking Hood & Supression - Application
TOWN OF VESTAL

Building Construction ... Code Enforcement ... Fire Codes
133 Front Street · Vestal · New York · 13850

Phone (607) 786-0980

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PROCEDURE FOR KITCHEN HOOD & SUPPRESSION SYSTEM BUILDING PERMIT

THIS REVIEW WILL TAKE ONE – TWO WEEKS! Please plan accordingly.

Please submit all of the following:

- ◇ Confirmation of current operating permit to work in Vestal, NY
- ◇ Original plans, specific to the project specifically noting:
 - The appliances and their locations within the cooking area
 - Measurements showing clearance to combustibles
 - Aisle sizes between appliances and work areas
 - Hood size and location
 - Suppression system locations and mounting
 - Cross section drawings to show heights of appliances and hood
 - Definitive information on how the electric, gas or other fuel supply will be terminated in the event of an actuation by the suppression system.
- ◇ Provisions for make-up air
- ◇ Installation manuals and manufacturer product sheets
- ◇ Completed building permit application and non-refundable fee
- ◇ Other items noted on attached sheets

After the submittal is reviewed, corrections or modifications will be discussed and then a building permit may be issued.

Thank you

February 2011

Questions? Call the Town of Vestal Code Enforcement office (607) 748-1514 x 310

Kitchen Hood & Suppression System Submittal Guidelines For Plan Review and Approval

Commercial cooking systems. The automatic fire extinguishing system for commercial cooking systems, as required by section 609 of the Fire Code of New York State for type I hoods, shall be of the type recognized for the protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Pre-engineered automatic dry- and - wet chemical extinguishing systems shall be tested in accordance with UL 300 and listed and labeled for the intended application. Where a duct system is protected by a pre-engineered system and the installed length of the duct exceeds the length tested for the pre-engineered systems, additional engineered fire-extinguishing protection shall be provided in the unprotected portion of the duct. Other types of automatic fire-extinguishing systems shall be listed and labeled for specific use as protection for commercial cooking operations. The system shall be installed in accordance with the Fire Code of New York State, and its listing and the manufacture's installation instructions. Automatic fire-extinguishing systems of the following types shall be installed in accordance with NFPA 96 and the referenced standards indicated.

1. Carbon Dioxide extinguishing system NFPA 12
2. Automatic sprinkler system NFPA 13
3. Foam – water sprinkler system or foam water spray systems NFPA 16
4. Dry – chemical extinguishing system NFPA 17
5. Wet – chemical extinguishing system NFPA 17A

Listings

Submittals shall include copies of all relevant portions of the installation manual for the proposed suppression system. Listings for each component shall be supplied. Where complete manuals are provided by the applicant, specific components shall be identified within the manuals.

Plans

Drawings shall include:

- If it is a pre-engineered system provide the name and indicate the system type, i.e. Ansul R-102, Range Guard, etc.
- 3 dimensional representations of the hood, duct, nozzles and appliances.
- Appliances types and dimensions shall each be labeled.
- Nozzle types, flow points and spray directions shall be indicated
- Nozzle mounting height range shall each be labeled
- Fuse temperature ratings and locations shall be indicated
- Tank size(s) shall and flow point capacity shall be labeled
- Duct dimensions shall be labeled
- Plenum dimensions shall be labeled
- Plenum filter arrangement shall be labeled, i.e.: “single filter”, “V-bank”, “No filter” or graphically represented in drawing.
- Supply and branch pipe schedule and sizes shall each be indicated
- List total available flow points and total used flow points.
- Gas valve information.
- Electrical interconnection information
- Pull station to be shown.
- 2.5 gallon class K extinguisher to be referenced on the plan.
- Include notations: “Upon activation of system, exhaust fan shall remain operating and make-up air shall shut off; All fuel and power under hood to shut down and the fire alarm shall be activated (if there is one in the building)”

- System annunciation; NFPA 96- 10.6.1 Upon activation of an automatic fire extinguishing system, an audible or visual indicator shall be provided to show the system has been activated (in buildings with no fire alarm) .
- Show location of indicator and type and provide cut sheets for equipment used.
- List name and address of installation location.
- List name and phone number of the plan designer.

Hood information. Please provide the following information on the hood

- Construction information for the hood (i.e.; 18 msg thickness stainless steel, continuous weld etc.)
- Installation manual, cut sheet showing UL listing and installation instructions for hood. If factory built, the hood must be tested in accordance with UL 710 and comply with the Mechanical Code of New York State.
- Hoods shall have an 18 inch clearance to combustibles unless an approved clearance reduction system is used. Please provide construction information on clearance reduction system and show clearance to combustibles on the drawings.
- Exhaust fan information, provide information on fan if it is listed and labeled as a power roof ventilator for restaurant cooking appliances.
- Construction information on grease duct material.
- Indicate on drawing joints and seems and how connected.
- Show clearance to combustibles, **18 inches of clearance is required** unless the duct is listed and labeled and installed in accordance with section 304.1 of the New York State Mechanical Code. Please provide information on listing.
- Show location and construction of all supports for the hood, ducts, and fan.
- Provide information and calculations on hood exhaust capacity (air flow, CFM's) and provisions for make- up air were required.

ALL WORK SHALL BE DONE IN COMPLIANCE WITH THE APPLICABLE NEW YORK STATE UNIFORM FIRE PREVENTION AND BUILDING CODE AND REFERENCED STANDARDS.

SAMPLE

ANSUL R-102 6 GAL. SYSTEM



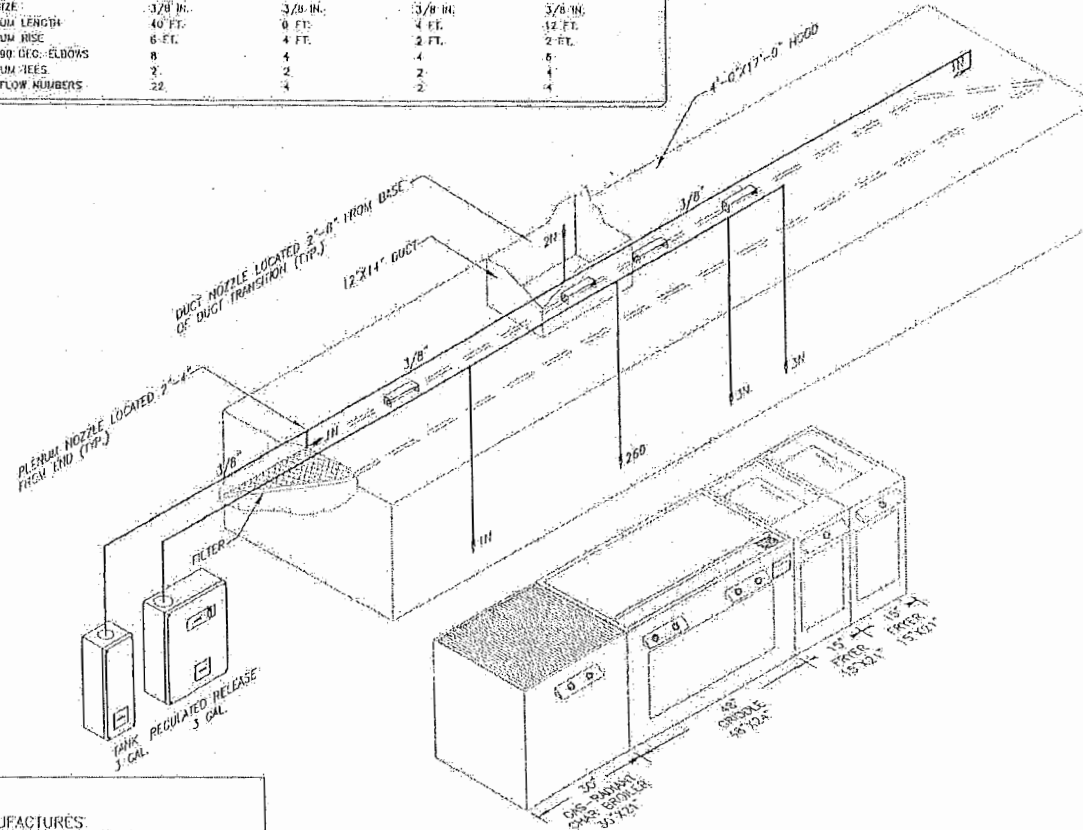
SCOPE OF WORK:

FIRE EXTINGUISHING SYSTEM INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS FOR PRESSURIZED HOOD AND APPLIANCE PROTECTION ALL STANDARDS AS PER NFPA 17A AND NFPA 14 2002 EDITION

LEGEND:

ITEM	SYMBOL	DESCRIPTION	QTY.	FLOW POINTS	NOZZLES HEIGHT
1) REMOTE PULL STATION	⊙	AR-15	1	---	48"-54"
2) FUEL SHUT-OFF DEVICE	⊙	FS-450*	1	---	---
3) GAS SHUT-OFF VALVE	⊙	GS-27	1	---	---
4) STORAGE CYLINDER	⊙	R-102 3 GAL.	6	---	---
5) RANGE NOZZLE	⊙	212	6	0	48"-50"
6) RANGE NOZZLE	⊙	118	0	0	16"-22"
7) DUCT NOZZLE	⊙	200	1	2	20"-24"
8) DUCT NOZZLE	⊙	230	0	0	21"-24"
9) PLENUM NOZZLE	⊙	21	2	5	21"-24"
10) CHAMBER NOZZLE	⊙	11	1	1	15"-18"
11) SALAMANDER NOZZLE	⊙	17/81	0	0	---
12) DUCT NOZZLE	⊙	21	0	0	---
13) PLENUM NOZZLE	⊙	11	2	2	---
14) DUCT NOZZLE	⊙	21	1	2	---
TOTAL FLOW POINTS USED			13		
MAXIMUM ALLOWED FAS SYSTEM			22		
* IN FLOW POINT FOR 3 GAL. (P.W.)					

5 GALLON SYSTEM PIPING REQUIREMENTS	SUPPLY LINE	DUCT BRANCH LINE	PLENUM BRANCH LINE	APPLIANCE BRANCH LINE
1) PIPE SIZE	3/8 IN.	3/8 IN.	3/8 IN.	3/8 IN.
2) MAXIMUM LENGTH	40 FT.	0 FT.	4 FT.	12 FT.
3) MAXIMUM RISE	6 FT.	4 FT.	2 FT.	2 FT.
4) MAX. 90 DEG. ELBOWS	8	4	4	6
5) MAXIMUM TEES	2	2	2	4
6) MAX. FLOW NUMBERS	22	4	2	4



ANSUL CABLE LIMITATIONS
 REMOTE PULL:
 MAX #. ELBOWS=20
 MAX. 1/16" CABLE=150FT.
 DETECTION:
 MAX #. PULLEYS=20
 MAX. 1/16" CABLE=150FT.
 MAX #. OF DETECTORS=15
 GAS VALVE
 MAX #. PULLEYS=20
 MAX. 1/16" CABLE=150FT.

NOTE:
 BUILDING FIRE ALARM SYSTEM TO BE TIED INTO THE KITCHEN FIRE SUPPRESSION SYSTEM VIA ELECTRICIAN SHUNT TRIP AS REQUIRED BY AHJ. (BY OTHERS)

GENERAL NOTES

1. ALL INSTALLATION PROCEDURES ARE IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATIONS AND IN ACCORDANCE WITH NFPA 17 AND 96 2002 EDITION STANDARDS.
2. REMOTE PULL STATION IS MOUNTED NO HIGHER THAN 48" FROM FINISHED FLOOR AND ON WAY TO EGRESS.
3. THE HOOD EXTINGUISHING SYSTEM MUST BE INTERCONNECTED TO BUILDING FIRE ALARM UNDER SEPARATE PERMIT BY OTHERS IF APPLICABLE.
4. AUTOMATIC FUEL SHUT-DOWN DEVICE(S) SHALL SHUT DOWN ALL SOURCES OF FUEL AND POWER.(INCLUDING ELECTRICAL OUTLETS)
5. A K-CLASS RATED FIRE EXTINGUISHER SHALL BE ACCESSIBLE WITHIN 30 FOOT UNOBSTRUCTED PATH FROM COOKING EQUIPMENT IS REQUIRED.
6. SYSTEM TO BE TEST FIRED AND WITNESSED BY LOCAL FIRE AUTHORITIES UPON COMPLETION.
7. IT WILL BE THE SOLE RESPONSIBILITY OF THE RESTAURANT OWNER TO MAINTAIN AND SERVICE THE SYSTEM AS PRESCRIBED BY LOCAL AND STATE LAWS.

FLOOR SHOULD BE MARKED FOR APPLIANCE LOCATION
 ALL PIPE AND FITTINGS BLK. IRON SCH. 40

ANSUL R-102 6 GAL. FIRE SUPPRESSION SYSTEM
 SCALE:NONE

SAMPLE FIRE PROTECTION COMPANY
 12345 S.E. 123 ST.
 VANCOUVER, WA 98668
 SALES (206) 555-2100
 FAX (206) 555-1234
 EMAIL: SALES@SFP.COM

DATE	BY	CHKD	REV

SCALE: NTS
 ANSUL R-102 6 GAL.
 NFPA 13.86 2002 EDITION SYSTEM

SAMPLE RESTAURANT
 KITCHEN FIRE SUPPRESSION
 DESIGNED BY
 BOB W. EVERGREEN BY
 VANCOUVER, WA 98668

SFP/RS/01/01.DWG
 FS-1
 SHEET 1 OF 1

**SECTION 506
COMMERCIAL KITCHEN HOOD VENTILATION
SYSTEM DUCTS AND EXHAUST EQUIPMENT**

506.1 General. Commercial kitchen hood ventilation ducts and exhaust equipment shall comply with the requirements of this section. Commercial kitchen grease ducts shall be designed for the type of cooking appliance and hood served.

506.2 Corrosion protection. Ducts exposed to the outside atmosphere or subject to a corrosive environment shall be protected against corrosion in an approved manner.

506.3 Ducts serving Type I hoods. Type I exhaust ducts shall be independent of all other exhaust systems except as provided in Section 506.3.5. Commercial kitchen duct systems serving Type I hoods shall be designed, constructed and installed in accordance with Sections 506.3.1 through 506.3.12.3.

506.3.1 Duct materials. Ducts serving Type I hoods shall be constructed of materials in accordance with Sections 506.3.1.1 and 506.3.1.2.

506.3.1.1 Grease duct materials. Grease ducts serving Type I hoods shall be constructed of steel not less than 0.055 inch (1.4 mm) (No. 16 Gage) in thickness or stainless steel not less than 0.044 inch (1.1 mm) (No. 18 Gage) in thickness.

Exception: Listed and labeled factory-built commercial kitchen grease ducts shall be installed in accordance with Section 304.1.

506.3.1.2 Makeup air ducts. Make up air ducts connecting to or within 18 inches (457 mm) of a Type I hood shall be constructed and installed in accordance with Sections 603.1, 603.3, 603.4, 603.9, 603.10 and 603.12. Duct insulation installed within 18 inches (457 mm) of a Type I hood shall be noncombustible or shall be listed for the application.

506.3.2 Joints, seams and penetrations of grease ducts. Joints, seams and penetrations of grease ducts shall be made with a continuous liquid-tight weld or braze made on the external surface of the duct system.

Exceptions:

1. Penetrations shall not be required to be welded or brazed where sealed by devices that are listed for the application.

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2. Internal welding or brazing shall not be prohibited provided that the joint is formed or ground smooth and is provided with ready access for inspection.
3. Factory-built commercial kitchen grease ducts listed and labeled in accordance with UL 1978 and installed in accordance with Section 304.1.

506.3.2.1 Duct joint types. Duct joints shall be butt joints or overlapping duct joints of either the telescoping or bell type. Overlapping joints shall be installed to prevent ledges and obstructions from collecting grease or interfering with gravity drainage to the intended collection point. The difference between the inside cross-sectional dimensions of overlapping sections of duct shall not exceed 0.25 inch (6 mm). The length of overlap for overlapping duct joints shall not exceed 2 inches (51 mm).

506.3.2.2 Duct-to-hood joints. Duct-to-hood joints shall be made with continuous internal or external liquid-tight welded or brazed joints. Such joints shall be smooth, accessible for inspection, and without grease traps.

Exceptions: This section shall not apply to:

1. A vertical duct-to-hood collar connection made in the top plane of the hood in accordance with all of the following:
 - 1.1. The hood duct opening shall have a 1-inch-deep (25 mm), full perimeter, welded flange turned down into the hood interior at an angle of 90 degrees from the plane of the opening.
 - 1.2. The duct shall have a 1-inch-deep (25 mm) flange made by a 1-inch by 1-inch (25 mm by 25 mm) angle iron welded to the full perimeter of the duct not less than 1 inch (25 mm) above the bottom end of the duct.
 - 1.3. A gasket rated for use at not less than 1,500°F (815°C) is installed between the duct flange and the top of the hood.
 - 1.4. The duct-to-hood joint shall be secured by stud bolts not less than 0.25 inch (6.4 mm) in diameter welded to the hood with a spacing not greater than 4 inches (102 mm) on center for the full perimeter of the opening. All bolts and nuts are to be secured with lockwashers.
2. Listed and labeled duct-to-hood collar connections installed in accordance with Section 304.1.

506.3.2.3 Duct-to-exhaust fan connections. Duct-to-exhaust fan connections shall be flanged and gasketed at the base of the fan for vertical discharge fans; shall be flanged, gasketed and bolted to the inlet of the fan for

side-inlet utility fans; and shall be flanged, gasketed and bolted to the inlet and outlet of the fan for in-line fans.

506.3.2.4 Vibration isolation. A vibration isolation connector for connecting a duct to a fan shall consist of noncombustible packing in a metal sleeve joint of approved design or shall be a coated-fabric flexible duct connector listed and labeled for the application. Vibration isolation connectors shall be installed only at the connection of a duct to a fan inlet or outlet.

506.3.2.5 Grease duct test. Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed in the presence of the code enforcement official. Ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ductwork from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary equipment and perform the grease duct leakage test. A light test or an approved equivalent test method shall be performed to determine that all welded and brazed joints are liquid tight. A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of duct work to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls.

A test shall be performed for the entire duct system, including the hood-to-duct connection. The ductwork shall be permitted to be tested in sections, provided that every joint is tested.

506.3.3 Grease duct supports. Grease duct bracing and supports shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *Building Code of New York State*. Bolts, screws, rivets and other mechanical fasteners shall not penetrate duct walls.

506.3.4 Air velocity. Grease duct systems serving a Type I hood shall be designed and installed to provide an air velocity within the duct system of not less than 500 feet per minute (2.5 m/s).

Exception: The velocity limitations shall not apply within duct transitions utilized to connect ducts to differently sized or shaped openings in hoods and fans, provided that such transitions do not exceed 3 feet (914 mm) in length and are designed to prevent the trapping of grease.

506.3.5 Separation of grease duct system. A separate grease duct system shall be provided for each Type I hood. A separate grease duct system is not required where all of the following conditions are met:

1. All interconnected hoods are located within the same story.
2. All interconnected hoods are located within the same room or in adjoining rooms.
3. Interconnecting ducts do not penetrate assemblies required to be fire-resistance rated.

4. The grease duct system does not serve solid fuel-fired appliances.

506.3.6 Grease duct clearances. Grease duct systems and exhaust equipment serving a Type I hood shall have a clearance to combustible construction of not less than 18 inches (457 mm), and shall have a clearance to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 3 inches (76 mm).

Exception: Listed and labeled factory-built commercial kitchen grease ducts and exhaust equipment installed in accordance with Section 304.1.

506.3.7 Prevention of grease accumulation in grease ducts. Duct systems serving a Type I hood shall be constructed and installed so that grease cannot collect in any portion thereof, and the system shall slope not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) toward the hood or toward an approved grease reservoir. Where horizontal ducts exceed 75 feet (22 860 mm) in length, the slope shall not be less than one unit vertical in 12 units horizontal (8.3-percent slope). Fire dampers, combination fire/smoke dampers and any similar device that will obstruct the exhaust flow shall be prohibited in commercial kitchen exhaust systems.

506.3.8 Grease duct cleanouts and other openings. Grease duct systems shall not have openings therein other than those required for proper operation and maintenance of the system. Any portion of such system having sections not provided with access from the duct entry or discharge shall be provided with cleanout openings. Cleanout openings shall be equipped with tight-fitting doors constructed of steel having a thickness not less than that required for the duct. Doors shall be equipped with a substantial method of latching, sufficient to hold the door tightly closed. Doors shall be designed so that they are operable without the use of a tool. Door assemblies, including any frames and gasketing, shall be approved for the purpose, and shall not have fasteners that penetrate the duct. Listed and labeled access door assemblies shall be installed in accordance with the terms of the listing.

506.3.8.1 Personnel entry. Where ductwork is large enough to allow entry of personnel, not less than one approved or listed opening having dimensions not less than 20 inches by 20 inches (508 mm by 508 mm) shall be provided in the horizontal sections, and in the top of vertical risers. Where such entry is provided, the duct and its supports shall be capable of supporting the additional load and the cleanouts specified in Section 506.3.8 are not required.

506.3.9 Grease duct horizontal cleanouts. Cleanouts located on horizontal sections of ducts shall be spaced not more than 20 feet (6096 mm) apart. The cleanouts shall be located on the side of the duct with the opening not less than 1.5 inches (38 mm) above the bottom of the duct, and not less than 1 inch (25 mm) below the top of the duct. The opening minimum dimensions shall be 12 inches (305 mm) on each side. Where the dimensions of the side of the duct prohibit the cleanout installation prescribed herein,

the openings shall be on the top of the duct or the bottom of the duct. Where located on the top of the duct, the opening edges shall be a minimum of 1 inch (25 mm) from the edges of the duct. Where located in the bottom of the duct, cleanout openings shall be designed to provide internal damming around the opening, shall be provided with gasketing to preclude grease leakage, shall provide for drainage of grease down the duct around the dam, and shall be approved for the application. Where the dimensions of the sides, top or bottom of the duct preclude the installation of the prescribed minimum-size cleanout opening, the cleanout shall be located on the duct face that affords the largest opening dimension and shall be installed with the opening edges at the prescribed distances from the duct edges as previously set forth in this section.

506.3.10 Grease duct enclosure. A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the outlet terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *Building Code of New York State*. Ducts shall be enclosed in accordance with the *Building Code of New York State* requirements for shaft construction. The duct enclosure shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings. Clearance from the duct to the interior surface of enclosures of combustible construction shall be not less than 18 inches (457 mm). Clearance from the duct to the interior surface of enclosures of noncombustible construction or gypsum wall board attached to noncombustible structures shall be not less than 6 inches (152 mm). The duct enclosure shall serve a single grease exhaust duct system and shall not contain any other ducts, piping, wiring or systems.

Exceptions:

1. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration firestop system classified in accordance with ASTM E 814 and having an F and T rating equal to the fire-resistance rating of the assembly being penetrated and where the surface of the duct is continuously covered on all sides from the point at which the duct penetrates a ceiling, wall or floor to the outlet terminal with a classified and labeled material, system, method of construction or product specifically evaluated for such purpose, in accordance with ASTM E 2336. Exposed duct-wrap systems shall be protected where subject to physical damage.
2. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration firestop system classified in accordance with ASTM E 814 and having an F and T rating equal to the fire resistance rating of the assembly being penetrated and where a prefabricated grease duct enclosure assembly is protected on all sides from the point at which the duct penetrates a ceiling,

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wall or floor to the outlet terminal with a classified and labeled prefabricated system specifically evaluated for such purposes in accordance with UL 2221.

3. A duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance-rated roof/ceiling assembly.

506.3.11 Grease duct fire-resistive access opening.

Where cleanout openings are located in ducts within a fire-resistance-rated enclosure, access openings shall be provided in the enclosure at each cleanout point. Access openings shall be equipped with tight-fitting sliding or hinged doors that are equal in fire-resistive protection to that of the shaft or enclosure. An approved sign shall be placed on access opening panels with wording as follows: "ACCESS PANEL. DO NOT OBSTRUCT."

506.3.12 Exhaust outlets serving Type I hoods. Exhaust outlets for grease ducts serving Type I hoods shall conform to the requirements of Sections 506.3.12.1 through 506.3.12.3.

506.3.12.1 Termination above the roof. Exhaust outlets that terminate above the roof shall have the discharge opening located not less than 40 inches (1016 mm) above the roof surface.

506.3.12.2 Termination through an exterior wall. Exhaust outlets shall be permitted to terminate through exterior walls where the smoke, grease, gases, vapors, and odors in the discharge from such terminations do not create a public nuisance or a fire hazard. Such terminations shall not be located where protected openings are required by the *Building Code of New York State*. Other exterior openings shall not be located within 3 feet (914 mm) of such terminations.

506.3.12.3 Termination location. Exhaust outlets shall be located not less than 10 feet (3048 mm) horizontally from parts of the same or contiguous buildings, adjacent buildings, adjacent property lines and air intake openings into any building and shall be located not less than 10 feet (3048 mm) above the adjoining grade level.

Exception: Exhaust outlets shall terminate not less than 5 feet (1524 mm) from parts of the same or contiguous building, an adjacent building, adjacent property line and air intake openings into a building where air from the exhaust outlet discharges away from such locations.

506.4 Ducts serving Type II hoods. Single or combined Type II exhaust systems for food-processing operations shall be independent of all other exhaust systems. Commercial kitchen exhaust systems serving Type II hoods shall comply with Sections 506.4.1 and 506.4.2.

506.4.1 Type II exhaust outlets. Exhaust outlets for ducts serving Type II hoods shall comply with Sections 401.4 and 401.4.2. Such outlets shall be protected against local weather conditions and shall meet the provisions for exterior wall opening protectives in accordance with the *Building Code of New York State*.

506.4.2 Ducts. Ducts and plenums serving Type II hoods shall be constructed of rigid metallic materials. Duct construction, installation, bracing and supports shall comply with Chapter 6. Ducts subject to positive pressure and ducts conveying moisture-laden or waste-heat-laden air shall be constructed, joined and sealed in an approved manner.

506.5 Exhaust equipment. Exhaust equipment, including fans and grease reservoirs, shall comply with Sections 506.5.1 through 506.5.5 and shall be of an approved design or shall be listed for the application.

506.5.1 Exhaust fans. Exhaust fan housings serving a Type I hood shall be constructed as required for grease ducts in accordance with Section 506.3.1.1.

Exception: Fans listed and labeled in accordance with UL 762.

506.5.1.1 Fan motor. Exhaust fan motors shall be located outside of the exhaust airstream.

506.5.2 Exhaust fan discharge. Exhaust fans shall be positioned so that the discharge will not impinge on the roof, other equipment or appliances or parts of the structure. A vertical discharge fan shall be manufactured with an approved drain outlet at the lowest point of the housing to permit drainage of grease to an approved grease reservoir.

506.5.3 Exhaust fan mounting. An upblast fan shall be hinged and supplied with a flexible weatherproof electrical cable to permit inspection and cleaning. The ductwork shall extend a minimum of 18 inches (457 mm) above the roof surface.

506.5.4 Clearances. Exhaust equipment serving a Type I hood shall have a clearance to combustible construction of not less than 18 inches (457 mm).

Exception: Factory-built exhaust equipment installed in accordance with Section 304.1 and listed for a lesser clearance.

506.5.5 Termination location. The outlet of exhaust equipment serving Type I hoods shall be in accordance with Section 506.3.12.

Exception: The minimum horizontal distance between vertical discharge fans and parapet-type building structures shall be 2 feet (610 mm) provided that such structures are not higher than the top of the fan discharge opening.

SECTION 507 COMMERCIAL KITCHEN HOODS

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or Type II and shall be designed to capture and confine cooking vapors and residues. Commercial kitchen exhaust hood systems shall operate during the cooking operation.

Exceptions:

1. Factory-built commercial exhaust hoods which are tested in accordance with UL 710, listed, labeled

and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.7, 507.11, 507.12, 507.13, 507.14 and 507.15.

2. Factory-built commercial cooking recirculating systems which are tested in accordance with UL 710B, listed, labeled and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.12, 507.13, 507.14 and 507.15.
3. Net exhaust volumes for hoods shall be permitted to be reduced during no-load cooking conditions, where engineered or listed multispeed or variable-speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section.

507.2 Where required. A Type I or Type II hood shall be installed at or above all commercial cooking appliances in accordance with Sections 507.2.1 and 507.2.2. Where any cooking appliance under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed.

507.2.1 Type I hoods. Type I hoods shall be installed where cooking appliances produce grease or smoke, such as, occurs with griddles, fryers, broilers, ovens, ranges and wok ranges.

507.2.1.1 Operation. Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other approved methods.

507.2.2 Type II hoods. Type II hoods shall be installed where cooking or dishwashing appliances produce heat, steam, or products of combustion and do not produce grease or smoke, such as steamers, kettles, pasta cookers and dishwashing machines.

Exceptions:

1. Under-counter-type commercial dishwashing machines.
2. A Type II hood is not required for dishwashers and potwashers that are provided with heat and water vapor exhaust systems that are supplied by the appliance manufacturer and are installed in accordance with the manufacturer's instructions.
3. A single light-duty electric convection, bread, retherm or microwave oven. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.
4. A Type II hood is not required for the following electrically heated appliances: toasters, steam tables, popcorn poppers, hot dog cookers, coffee makers, rice cookers, egg cookers, holding/warming ovens. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.

507.2.4 Domestic cooking appliances used for commercial purposes. Domestic cooking appliances utilized for commercial purposes shall be provided with Type I or Type II hoods as required for the type of appliances and processes in accordance with Sections 507.2, 507.2.1 and 507.2.2.

507.2.5 Solid fuel. Type I hoods for use over solid fuel-burning cooking appliances shall discharge to an exhaust system that is independent of other exhaust systems.

507.2.6 Extra-heavy-duty. Type I hoods for use over extra-heavy-duty cooking appliances shall not cover other appliances that require fire extinguishing equipment and such hoods shall discharge to an exhaust system that is independent of other exhaust systems.

507.3 Fuel-burning appliances. Where vented fuel-burning appliances are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the appliance vents.

507.4 Type I materials. Type I hoods shall be constructed of steel not less than 0.043 inch (1.09 mm) (No. 18 MSG) in thickness, or stainless steel not less than 0.037 inch (0.94 mm) (No. 20 MSG) in thickness.

507.5 Type II hood materials. Type II hoods shall be constructed of steel not less than 0.030 inch (0.76 mm) (No. 22 Gage) in thickness, stainless steel not less than 0.024 inch (0.61 mm) (No. 24 Gage) in thickness, copper sheets weighing not less than 24 ounces per square foot (7.3 kg/m²), or of other approved material and gage.

507.6 Supports. Type I hoods shall be secured in place by noncombustible supports. All Type I and Type II hood supports shall be adequate for the applied load of the hood, the unsupported ductwork, the effluent loading, and the possible weight of personnel working in or on the hood.

507.7 Hood joints, seams and penetrations. Hood joints, seams and penetrations shall comply with Sections 507.7.1 and 507.7.2.

507.7.1 Type I hoods. External hood joints, seams and penetrations for Type I hoods shall be made with a continuous external liquid-tight weld or braze to the lowest outermost perimeter of the hood. Internal hood joints, seams, penetrations, filter support frames, and other appendages attached inside the hood shall not be required to be welded or brazed but shall be otherwise sealed to be grease tight.

Exceptions:

1. Penetrations shall not be required to be welded or brazed where sealed by devices that are listed for the application.
2. Internal welding or brazing of seams, joints, and penetrations of the hood shall not be prohibited provided that the joint is formed smooth or ground so as to not trap grease, and is readily cleanable.

507.7.2 Type II hoods. Joints, seams and penetrations for Type II hoods shall be constructed as set forth in Chapter 6, shall be sealed on the interior of the hood and shall pro-

EXHAUST SYSTEMS

vide a smooth surface that is readily cleanable and water tight.

507.8 Cleaning and grease gutters. A hood shall be designed to provide for thorough cleaning of the entire hood. Grease gutters shall drain to an approved collection receptacle that is fabricated, designed and installed to allow access for cleaning.

507.9 Clearances for Type I hood. A Type I hood shall be installed with a clearance to combustibles of not less than 18 inches (457 mm).

Exception: Clearance shall not be required from gypsum wallboard attached to noncombustible structures provided that a smooth, cleanable, nonabsorbent and noncombustible material is installed between the hood and the gypsum wallboard over an area extending not less than 18 inches (457 mm) in all directions from the hood.

507.10 Hoods penetrating a ceiling. Type I hoods or portions thereof penetrating a ceiling, wall or furred space shall comply with all the requirements of Section 506.3.10.

507.11 Grease filters. Type I hoods shall be equipped with listed grease filters designed for the specific purpose. Grease-collecting equipment shall be provided with access for cleaning. The lowest edge of a grease filter located above the cooking surface shall be not less than the height specified in Table 507.11.

**TABLE 507.11
MINIMUM DISTANCE BETWEEN THE LOWEST EDGE
OF A GREASE FILTER AND THE COOKING SURFACE
OR THE HEATING SURFACE**

TYPE OF COOKING APPLIANCES	HEIGHT ABOVE COOKING SURFACE (feet)
Without exposed flame	0.5
Exposed flame and burners	2
Exposed charcoal and charbroil type	3.5

For SI: 1 foot = 304.8 mm.

507.11.1 Criteria. Filters shall be of such size, type and arrangement as will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or unit was designed or approved. Filter units shall be installed in frames or holders so as to be readily removable without the use of separate tools, unless designed and installed to be cleaned in place and the system is equipped for such cleaning in place. Removable filter units shall be of a size that will allow them to be cleaned in a dishwashing machine or pot sink. Filter units shall be arranged in place or provided with drip-intercepting devices to prevent grease or other condensate from dripping into food or on food preparation surfaces.

507.11.2 Mounting position. Filters shall be installed at an angle of not less than 45 degrees (0.79 rad) from the horizontal and shall be equipped with a drip tray beneath the lower edge of the filters.

507.12 Canopy size and location. The inside lower edge of canopy-type Type I and II commercial hoods shall overhang or extend a horizontal distance of not less than 6 inches (152 mm) beyond the edge of the top horizontal surface of the appliance on all open sides. The vertical distance between the front lower lip of the hood and such surface shall not exceed 4 feet (1219 mm).

Exception: The hood shall be permitted to be flush with the outer edge of the cooking surface where the hood is closed to the appliance side by a noncombustible wall or panel.

507.13 Capacity of hoods. Commercial food service hoods shall exhaust a minimum net quantity of air determined in accordance with this section and Sections 507.13.1 through 507.13.4. The net quantity of exhaust air shall be calculated by subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood. Where any combination of heavy-duty, medium-duty and light-duty cooking appliances are utilized under a single hood, the exhaust rate required by this section for the heaviest duty appliance covered by the hood shall be used for the entire hood.

507.13.1 Extra-heavy-duty cooking appliances. The minimum net airflow for Type I hoods used for heavy-duty cooking appliances shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	Not allowed
Double island canopy (per side)	550
Eyebrow	Not allowed
Single island canopy	700
Wall-mounted canopy	550

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.13.2 Heavy-duty cooking appliances. The minimum net airflow for Type I hoods used for heavy-duty cooking appliances shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	400
Double island canopy (per side)	400
Eyebrow	Not allowed
Single island canopy	600
Wall-mounted canopy	400

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.13.3 Medium-duty cooking appliances. The minimum net airflow for Type I hoods used for medium-duty cooking appliances shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	300
Double island canopy (per side)	300
Eyebrow	250
Single island canopy	500
Wall-mounted canopy	300

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.13.4 Light-duty cooking appliances. The minimum net airflow for Type I hoods used for light duty cooking appliances and food service preparation and cooking operations approved for use under a Type II hood shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	250
Double island canopy (per side)	250
Eyebrow	250
Single island canopy	400
Wall-mounted canopy	200

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.13.5 Dishwashing appliances. The minimum net airflow for Type II hoods used for dishwashing appliances shall be 100 CFM per linear foot of hood length.

Exception: Dishwashing appliances and equipment installed in accordance with Section 507.2.2, Exception 2.

507.14 Noncanopy size and location. Noncanopy-type hoods shall be located a maximum of 3 feet (914 mm) above the cooking surface. The edge of the hood shall be set back a maximum of 1 foot (305 mm) from the edge of the cooking surface.

507.15 Exhaust outlets. Exhaust outlets located within the hood shall be located so as to optimize the capture of particulate matter. Each outlet shall serve not more than a 12-foot (3658 mm) section of hood.

507.16 Performance test. A performance test shall be conducted upon completion and before final approval of the installation of a ventilation system serving commercial cooking appliances. The test shall verify the rate of exhaust airflow required by Section 507.13, makeup airflow required by Section 508, and proper operation as specified in this chapter. The permit holder shall furnish the necessary test equipment and devices required to perform the tests.

507.16.1 Capture and containment test. The permit holder shall verify capture and containment performance of the exhaust system. This field test shall be conducted with all appliances under the hood at operating temperatures, with all sources of outdoor air providing makeup air for the hood operating and with all sources of recirculated air providing conditioning for the space in which the hood is located operating. Capture and containment shall be verified visually by observing smoke or steam produced by actual or simulated cooking, such as with smoke candles, smoke puffers, etc.

**SECTION 508
COMMERCIAL KITCHEN MAKEUP AIR**

508.1 Makeup air. Makeup air shall be supplied during the operation of commercial kitchen exhaust systems that are provided for commercial cooking appliances. The amount of makeup air supplied shall be approximately equal to the amount of exhaust air. The makeup air shall not reduce the effectiveness of the exhaust system. Makeup air shall be provided by gravity or mechanical means or both. For mechani-

cal makeup air systems, the exhaust and makeup air systems shall be electrically interlocked to insure that makeup air is provided whenever the exhaust system is in operation. Makeup air intake opening locations shall comply with Sections 401.4 and 401.4.1.

508.1.1 Makeup air temperature. The temperature differential between makeup air and the air in the conditioned space shall not exceed 10°F (6°C).

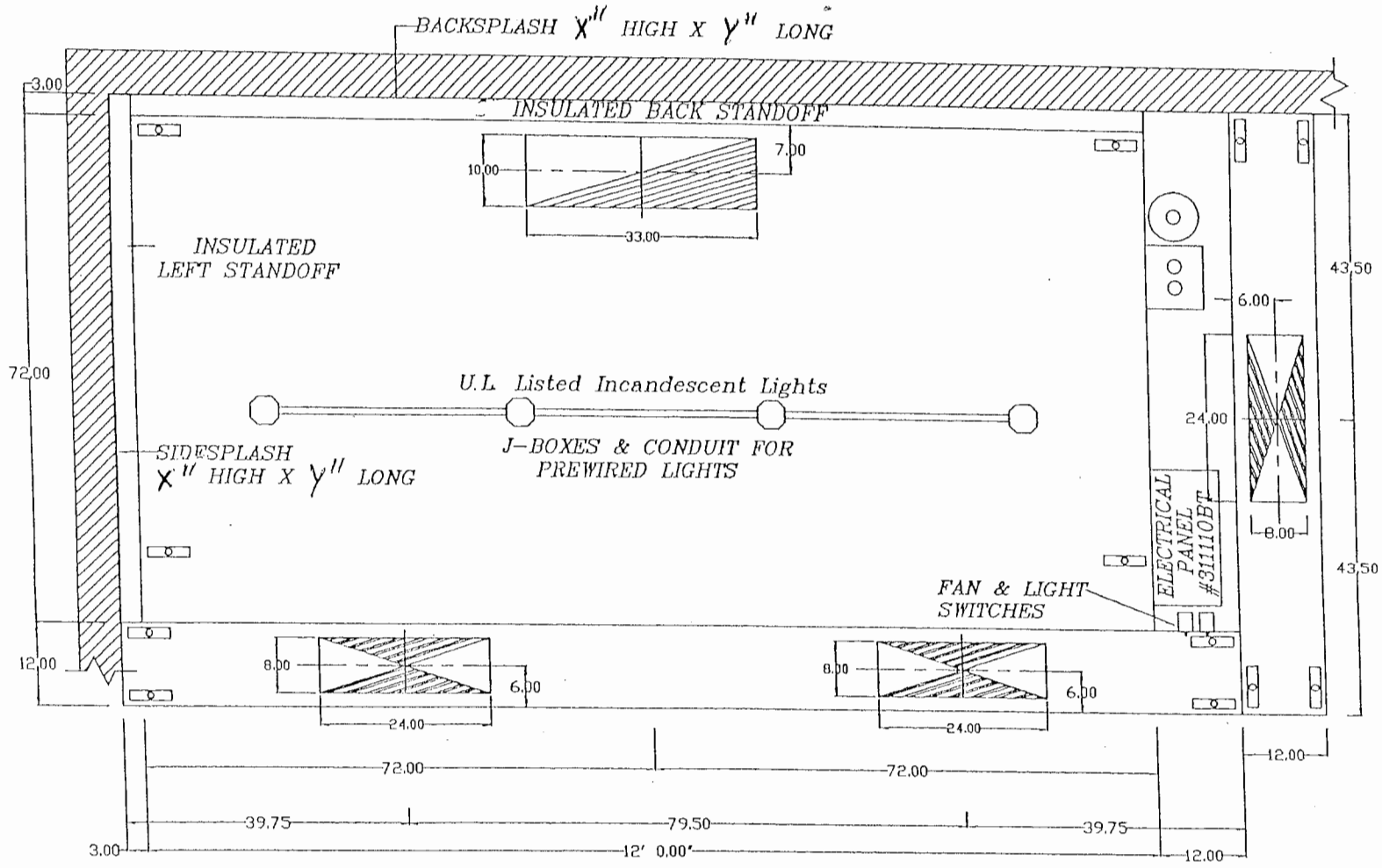
Exceptions:

1. Makeup air that is part of the air-conditioning system.
2. Makeup air that does not decrease the comfort conditions of the occupied space.

508.2 Compensating hoods. Manufacturers of compensating hoods shall provide a label indicating minimum exhaust flow and/or maximum makeup airflow that provides capture and containment of the exhaust effluent.

**SECTION 509
FIRE SUPPRESSION SYSTEMS**

509.1 Where required. Commercial cooking appliances required by Section 507.2.1 to have a Type I hood shall be provided with an approved automatic fire suppression system complying with the *Building Code of New York State* and the *Fire Code of New York State*.



HOOD #1 PLAN VIEW - 12' 0.00' LONG 7224ND-PSP

SAMPLE

HOOD INFORMATION

HOOD NO.	MODEL	LENGTH	MAX. COOKING TEMP.	EXHAUST PLENUM					SUPPLY PLENUM					HOOD CONSTRUCTION	HOOD CONFIG.	
				TOTAL EXH. CFM	RISER(S)				TOTAL SUP. CFM	RISER(S)					END TO END	ROW
				WIDTH	LENG.	DIA.	CFM	S.P.	WIDTH	LENG.	DIA.	CFM	S.P.			
1	7224 ND-PSP-FS	12' 0.00'	450 Deg.	3500	10'	33'		3500	-0.690'	2800					430 SS Where Exposed	

HOOD INFORMATION

HOOD NO.	FILTER(S)				LIGHT(S)			UTILITY CABINET(S)						FIRE SYSTEM PIPING	HOOD WEIGHT
	TYPE	QTY	HEIGHT	LENGTH	QTY	TYPE	WIRE GUARD	LOCATION	FIRE SYSTEM		ELECTRICAL	SWITCHES			
									TYPE	SIZE	MODEL #	QUANTITY	LOCATION		
1	SS Baffle with Handles	4	16"	16"	4	Incandescent Light	NO	Right	Ansul R-102	3.0	311110BT	1 Light 1 Fan	Outside	YES	971 LBS.

PERFORATED SUPPLY PLENUM(S)

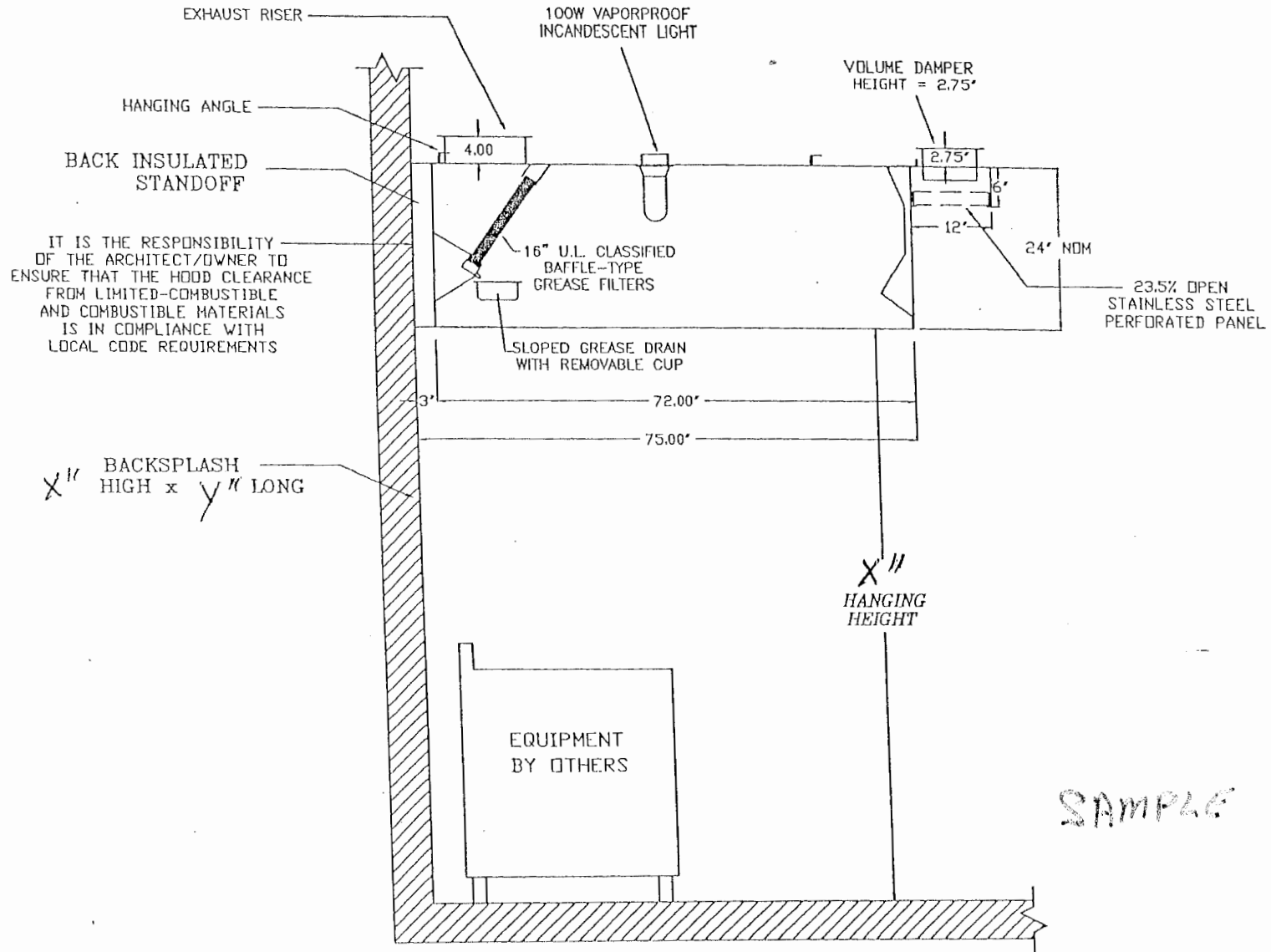
HOOD NO.	POS.	LENGTH	WIDTH	HEIGHT	RISER(S)				
					WIDTH	LENG.	DIA.	CFM	S.P.
1	Front	159.00'	12.00'	6.00'	8'	24'		963	0.165'
					8'	24'		963	0.165'
	Right	87.00'	12.00'	6.00'	8'	24'		874	0.129'

SAMPLE

HOOD OPTIONS

HOOD NO.	OPTION
1	BACKSPLASH 96.00' High X 159.00' Long Vertical Panel 430 SS
	BACK STANDOFF 3' Wide Insulated
	LEFT END STANDOFF 3' Wide Insulated
	LEFT SIDESPLASH 96.00' High X 75.00' Long Vertical Panel 430 SS

Cooking Hood & Supression - Application



IT IS THE RESPONSIBILITY OF THE ARCHITECT/OWNER TO ENSURE THAT THE HOOD CLEARANCE FROM LIMITED-COMBUSTIBLE AND COMBUSTIBLE MATERIALS IS IN COMPLIANCE WITH LOCAL CODE REQUIREMENTS

X" BACKSPASH HIGH x Y" LONG

X" HANGING HEIGHT

SAMPLE

HOOD #1 SECTION VIEW - MODEL #

Cooking Hood & Supression - Application

FAN INFORMATION

FAN UNIT NO.	FAN UNIT MODEL #	EXHAUST FAN										SUPPLY FAN									
		MODEL	TAG	CFM	S.P.	RPM	H.P.	Ø	VOLT	FLA	BLOWER	HOUSING	TAG	CFM	S.P.	RPM	H.P.	Ø	VOLT	FLA	
1	NRTP.B-A2-D.500-G15-NCA18FA EF/HAU	NCA18FA		3500	-1.000"	929	1.500	3	208	4.7	G15	A2-D.500B		2800	0.600"	793	1.500	3	208	4.7	

FAN OPTIONS

FAN NO.	OPTION (Qty. - Descr.)
1	1 -Grease Box
	1 -Motorized Backdraft Damper for A2-D Housing

GAS FIRED MAKE-UP AIR UNIT(S)

FAN UNIT NO.	BTU's	TEMP. RISE	GAS TYPE
1	166320	55 deg F	Natural

CURB ASSEMBLIES

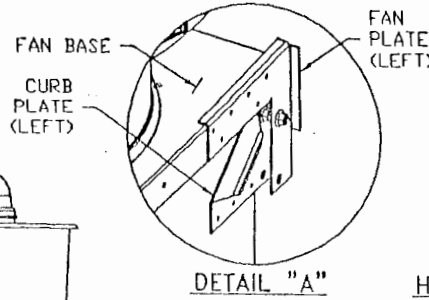
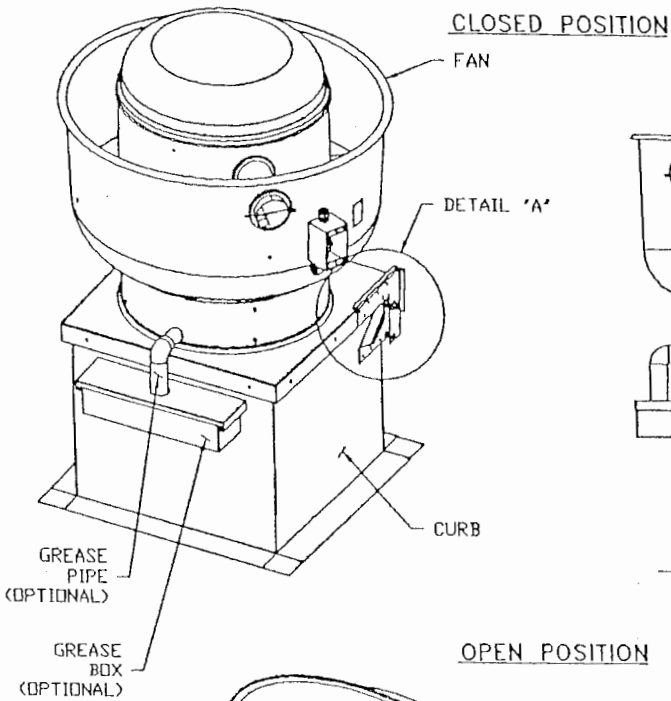
NO.	ON FAN	ITEM	SIZE
1	# 1	Curb	31.000'W x 123.875'L x 20.000/20.000'H Insulated Vented Hinged
		Rail	4.000'W x 4.000'L x 48.000'H
		Exhaust Adapter	From 31.750'sq To 26.500'sq x 9.000'H

SAMPLE

ELECTRICAL PACKAGES

NO.	TAG	PACKAGE #	LOCATION	SWITCHES		ROOFTOP STARTERS	OPTION	FANS CONTROLLED				
				LOCATION	QUANTITY			TYPE	Ø	H.P.	VOLT	FLA
1		311110BT	Utility Cabinet Right Hood # 1	Utility Cabinet Right Hood # 1	1 Light 1 Fan		Power for ShuntTrlp,Ex In Fire, Relay w/ 2DPDT on/off w/Sup	Exhaust	3	1.500	208	4.7
								Supply	3	1.500	208	4.7

HINGE KIT INSTALLATION



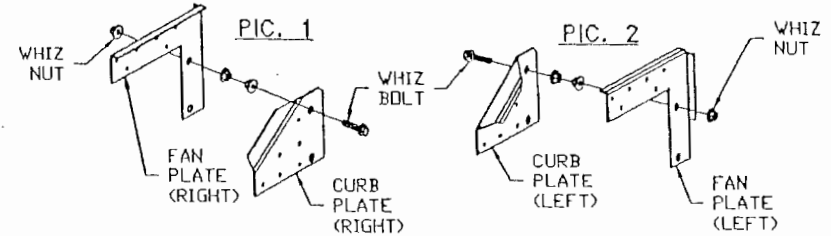
PARTS INCLUDED

- 2 - FAN PLATES (LEFT & RIGHT)
- 2 - CURB PLATES (LEFT & RIGHT)
- 2 - WHIZ BOLTS
- 6 - WHIZ NUTS
- SHEET METAL SCREWS
- 12 - SHORT (1/2' LG.)
- 12 - LONG (3/4' LG.)

HINGE KIT FIELD INSTALLATION

STEP 1)

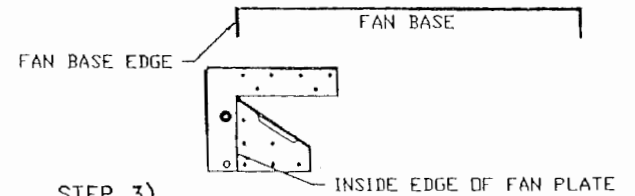
ASSEMBLE FAN PLATE WITH CURB PLATE AS SHOWN ON PIC. 1 AND PIC. 2 (IF PARTS ARE NOT ASSEMBLED).



STEP 2)

SEE DETAIL "A" FOR POSITIONING FAN PLATE ON FAN BASE. LINE UP FAN BASE EDGE TO INSIDE EDGE OF FAN PLATE AS SHOWN ON PIC. 3.

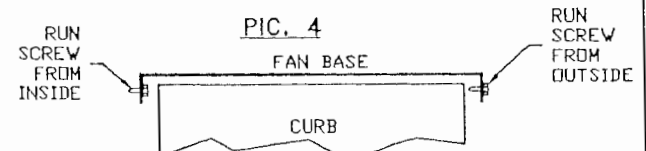
PIC. 3



STEP 3)

SCREW THE FAN PLATE TO THE FAN BASE USING THE (12) SHORT 1/2' LG. SHEET METAL SCREWS. NOTE: IF THE SCREWS HIT THE CURB, THEN RUN THE SCREWS FROM INSIDE THE FAN BASE, ALWAYS BE SURE THAT SCREWS DO NOT INTERFERE WITH CURB WHEN FAN SWINGS SEE PIC. 4.

PIC. 4

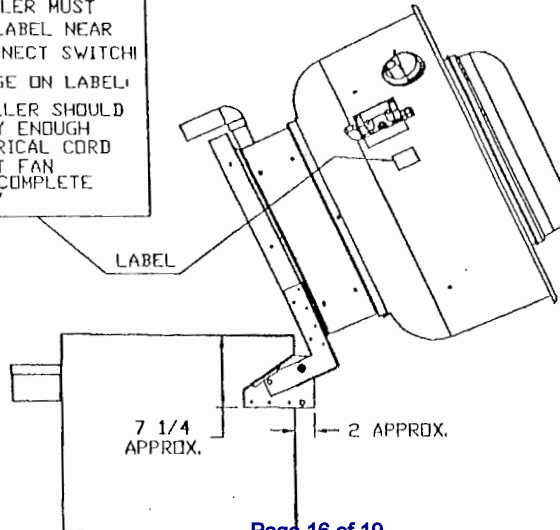


STEP 4)

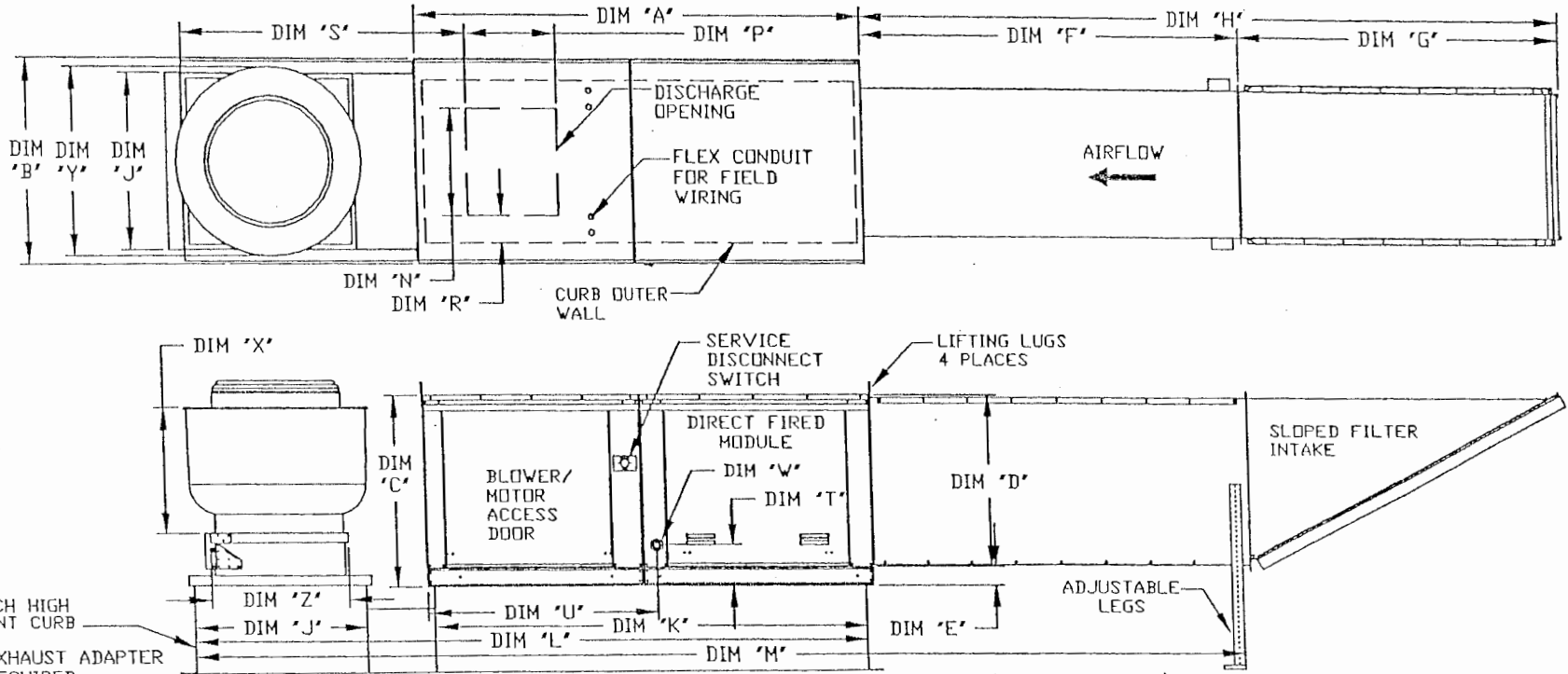
SCREW THE CURB PLATE TO THE CURB USING THE (12) LONG 3/4' LG. SHEET METAL SCREWS. TIGHTEN NUT AND BOLT ASSEMBLY, ENSURE SCREWS PROPERLY.

SAMPLE

ATTENTION!
 INSTALLER MUST READ LABEL NEAR DISCONNECT SWITCH MESSAGE ON LABEL: *INSTALLER SHOULD SUPPLY ENOUGH ELECTRICAL CORD TO LET FAN MAKE COMPLETE SWING*



MODULAR OUTDOOR DOWN DISCHARGE DIRECT FIRED HEATER--ROOF TOP PACKAGE WITH INTAKE HOOD



** 9 INCH HIGH EXHAUST ADAPTER MAY BE REQUIRED

SAMPLE

MODEL	WEIGHT	UNIT DIMENSIONS										CURB/RAIL				DISCHARGE OPENING				
		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	
D.500-G15	920 LBS	62-3/8	37-3/8	36-3/4	33-1/16	3-3/4	38	53-5/8	91-5/8	31	79	124	162	18-3/4	16	6-1/8	55-13/16	7-13/16	42-13/16	

ALL DIMENSIONS ARE NOMINAL AND GIVEN IN INCHES.

EXHAUST UNIT DIMENSIONS			
MODEL #	X	Y	Z **
NCA18FA	29-1/2	38-7/8	28

UNIT INFORMATION

MODEL	BTU RANGE (MBH)			GAS PRESSURE		GAS CONNECTION "W" (NPT)	CFM RANGE		FILTERS	
	BURNER LENGTH	BTU LOW	BTU HIGH	MIN	MAX		MIN	MAX	FILTER SIZE & QTY	MAX. FILTER VELOCITY
D.500-G15	12"	18	550	7" WC	14" WC	1	2500	6000	20"x25"x2" (3)	2600J CFM = 696 FPM

Cooking Hood & Supression - Application

System Size: ANSUL-3.0 Total FP required: 6
 Hood # 1 12' 0" Long x 72" Wide x 24" High
 Riser # 1 Size: 10' x 33'

NOTES

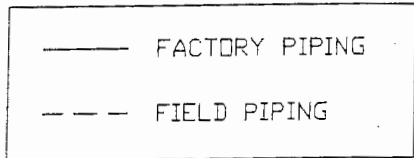
- FIELD PIPE DROPS AS SHOWN
- SLEEVING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- MAXIMUM 9 ELBOWS IN SUPPLY LINE.
- MINIMUM 72 INCHES OF AGENT LINE FROM TANK TO FIRST NOZZLE.
- IF APPLICABLE, PRE-PIPED CHARBROILER DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.

- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.

- THIS FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS

LEGEND - FIRE CABINET ANSUL SYSTEM

- 1A 1.5 GALLON TANK
- 1B 3 GALLON TANK
- 2 DEM AUTOMAN RELEASE
- 3 DEM REGULATED RELEASE
- 4 DEM REGULATED ACTUATOR
- 5 ANSULEX LIQUID AGENT (3 GAL.)
- 6 ANSULEX LIQUID AGENT (1.5 GAL.)
- 7 CARTRIDGE (101-20)
- 8 CARTRIDGE (101-10)
- 9 CARTRIDGE (101-30)
- 9A CARTRIDGE (LT-A-101-30)
- 9B DOUBLE TANK CARTRIDGE
- 10 TEST LINK
- 11 DOUBLE MICROSWITCH
- 12 HOSE ASSEMBLY
- 1100 DUCT NOZZLE (430913)
- 2W DUCT NOZZLE (419337)
- 1W NOZZLE ASSEMBLY (419336)
- 1F NOZZLE ASSEMBLY (419333)
- 1N NOZZLE ASSEMBLY (419335)
- 1/2N NOZZLE ASSEMBLY (419334)
- 3N NOZZLE ASSEMBLY (419338)
- 245 NOZZLE ASSEMBLY (419340)
- 230 NOZZLE ASSEMBLY (419339)
- 2120 NOZZLE ASSEMBLY (419343)
- 290 NOZZLE ASSEMBLY (419342)
- 260 NOZZLE ASSEMBLY (419341)
- 28 DETECTOR BRACKET
- 29 LOW TEMP FUSIBLE LINK
- 30 HIGH TEMP FUSIBLE LINK
- MGV MECHANICAL GAS VALVE
- EGV ELECTRICAL GAS VALVE
- 34 REMOTE MANUAL PULL STATION
- S SWIVEL ADAPTOR



SAMPLE

ANSUL PULL STATION DETAIL

