



COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUILDING & SAFETY DIVISION
Tel: (626) 458-3182

PROJ # _____
D. O. _____

COMMERCIAL HOOD AND KITCHEN
VENTILATION PLAN CHECK

JOB NAME _____ DATE _____
ADDRESS _____ PLAN CHECKER _____
APPLICANT _____ TELEPHONE # _____

CORRECTIONS

Directions

Provide the information and comply with the corrections indicated by the items below. Following each item describe in writing the corrective action taken and indicate where it may be found on the plans. If it was a paper submittal than return signed correction sheet, two sets of revised plans to Mechanical Section, 900 South Fremont Avenue, Third Floor, Alhambra, CA 91803. If it is an electronic submittal than upload revised plans and responses.

- 1) If there are any questions, please contact me at ereiter@dpw.lacounty.gov.
- 2) Please provide the following information:
 - a) Actual cross section and details of proposed hood and exhaust system(s) on the plans.
 - b) Kitchen floor plan showing top view of hood and type and location of all cooking equipment.
 - c) Roof plan indicating location of all rooftop mounted equipment (exhaust, make up air, AC units) and any parapet walls.
 - d) Indicate manufacturer name and model of proposed UL 762 listed exhaust fan on the plans.
 - e) Manufacturer's data sheet(s) for _____
 - f) Proof of Regional Planning Department approval for a restaurant at this location. (unincorporated areas in the County of Los Angeles.)

3) TERMINATION OF EXHAUST SYSTEM

- a) Rooftop Termination:
 - i) Exhaust flow shall be directed up and away from the surface of the roof and a minimum forty (40) inches above the roof surface. Sec 510.9.1 (8)(b)
 - ii) Grease duct shall extend a minimum of eighteen (18) inches above the roof surface. Sec 510.9.1 (8)(a)
 - iii) The exhaust outlet shall be a minimum of ten (10) feet from adjacent buildings, property lines or air intakes (three (3) feet above any air intake located within

ten (10) feet is allowed) and not less than five (5) feet from any combustible structure. Sec 510.9.1 (1)(2)(3)

b) Wall Termination

i) Wall terminations through a noncombustible wall with a minimum ten (10) feet clearance from outlet to adjacent buildings, property lines, grade level, combustible construction, electrical equipment or lines, and building openings at or below the plane of the exhaust termination are permitted. The closest point of any air intake or operable building opening above the plane of the exhaust termination shall be a minimum of ten (10) feet plus 0.25 feet for each 1 degree from horizontal. Sec 510.9.2 (1)

ii) Exhaust flow shall be directed perpendicularly outward from the wall face or upward. Sec 510.9.2 (2)

c) Termination outlet of Type II exhaust system shall not be directed onto a public way Sec 519.5 (3)

4) **TYPE I HOOD** Indicate the following on the plans:

a) Thickness of duct (minimum 16 gage carbon steel or 18 gage stainless steel). Sec 510.5.1

b) Ducts at exterior location shall be protected on the exterior by paint or other suitable weather-protective coating or be constructed of stainless steel. Sec 510.6.1

c) Thickness of hood (minimum 18 gage carbon steel or 20 gage stainless steel). EXCEPTION: Listed exhaust hoods if noted as part of their listing. Sec 508.3

d) Quantity and size of listed grease filters tested in accordance with UL1046.

e) Grease filters shall be equipped with a grease drip tray beneath their lower edge that is pitched to drain to a metal enclosure having not more than one gallon capacity. [509.2.4.1](#)

f) If installing a ceiling indicate the actual distance between the top of the hood and the bottom of the ceiling. Sec 507.4

i) If the distance between the ceiling and the hood is more than 18" extend limited combustible or noncombustible ceiling materials 18" beyond outer edge of the duct.

ii) If the distance between the ceiling and the hood is between 3" and 18", extend limited combustible or noncombustible ceiling materials 18" beyond outer edge of the hood.

iii) If the distance is less than 3" or hood penetrates the ceiling line, extend limited combustible or noncombustible ceiling materials 18" beyond outer edge of hood and comply with one of the following:

(1) If a rated enclosure is not required, the hood shall have a clearance of at least 3" from limited combustible materials, and materials within 3" of the hood must be noncombustible.

- (2) If a rated enclosure is required, provide a continuous rated enclosure from the penetration of the fire rated ceiling with clearance from the hood to the interior surface of the enclosure not less than 6".
- g) Distance between the hood and the adjoining wall(s) and indicate proposed wall construction materials when located within 18" of the hood. The 3" internal gap of the listed hood is to limited combustible construction. A fire rate wall is not necessarily a limited combustible wall.
 - h) Where enclosures are not required, hoods, grease removal devices, exhaust fans, and exhaust duct shall have a clearance of at least 18" from combustible materials, 3" from limited combustible materials, and 0" from noncombustible materials. [Sec 507.4](#)
 - i) EXCEPTION 1: Where a hood, duct, or grease removal device is listed for reduced clearances to combustible material and /or limited combustible material.
 - ii) EXCEPTION 2: Reduced clearance to combustible material if the material is protected. Please provide detail of protection applied to combustible or limited combustible material for reduced clearance per section 507.2 of the California Mechanical Code. [Sec 507.4](#)
 - i) A complete detail of proposed duct enclosure on the plans. In all buildings more than one story in height and in one-story buildings where the roof-ceiling assembly is required to have a fire resistance rating, the ducts shall be enclosed in a continuous enclosure extending from the lowest fire rated ceiling or floor above the hood. If the building is less than four stories the enclosure shall have a fire resistance rating of not less than one (1) hour, constructed as required by the Building Code. If the building is four stories or more in height, the enclosure shall have a fire resistance rating of not less than two (2) hours, constructed as required by the Building Code. Note: Each duct system shall constitute an individual system from any one floor, multiple ducts not permitted in a single enclosure. Sec 510.7
 - j) Clearance from the duct (or the exhaust fan) to the interior surface of enclosure or roofing materials of combustible construction shall be not less than 18" and clearance from the duct to the interior surface of enclosures of noncombustible or limited-combustible construction shall be not less than 6". Revise detail on the plans. EXCEPTION: Field applied grease duct enclosure or factory built grease duct enclosures installed in accordance with the conditions of their listing and manufacturer's installation requirements. Grease duct wrap shall be installed high enough above the roof to meet the above mentioned requirement. Sec 510.7.3
 - k) Openings in the enclosure walls shall be protected by fire doors installed in accordance with NFPA 80 of proper rating and shall be readily accessible. Indicate location of openings on the plan. Sec510.7.7
 - l) Duct enclosure shall be ventilated to the exterior through weather protected openings. [Sec 510.7](#)
 - m) Metal shield (or collar) to seal duct at point of penetration of ceiling.
 - n) All canopy type hoods shall overhang a minimum of 6" beyond the cooking surface on all open sides. EXCEPTION: Listed exhaust hoods if noted as part of their listing. Sec 508.5.1

- o) The vertical distance between the lip of hood and the cooking surface shall be not more than 4 feet. EXCEPTION: Listed exhaust hoods if noted as part of their listing. Sec 508.5.1
- p) The distance between the lowest edge of a grease removal device and the cooking surface shall not be less than 18". Grease removal devices serving charbroilers shall have a minimum vertical distance of four (4) feet. EXCEPTION: Grease removal devices supplied as part of listed hood assemblies installed in accordance with the terms of the listing and manufacturer's installation instructions. Sec 509.2
- q) Filters shall be installed at an angle not less than 45° from the horizontal. Sec 509.2.3.3
- r) Duct air velocity shall be sufficient for capture and removal of grease-laden cooking vapors, the air velocity through any duct shall be not less than 500 fpm and not more than 2500 feet per minute. Sec 511.2
- s) Each exhaust outlet shall serve not more than a 12' section of unlisted hood. Sec 508.7

5) **FIELD APPLIED AND FACTORY BUILT GREASE DUCT ENCLOSURES**

- a) Indicate on the plans the manufacturer's name and model of a listed field applied (ASTM E2336) or factory built (UL2221) grease duct enclosures. Sec 507.4.4
- b) The surface of the grease duct shall be continuously covered on all sides, from the point of connection at the hood, and extend the field applied or factory-built enclosure through the ceiling, wall or floor to the outlet terminal. Sec 507.4.5
- c) Field applied or factory-built grease duct enclosure shall not replace a conventional shaft when required by Section 707 of the Building Code.
- d) Please provide applicable manufacturer details of the grease exhaust duct and the field applied grease duct enclosure (or factory-built grease duct enclosure) on the plans in accordance with manufacturer's installation instructions.
- e) Please indicate the following notes on the plans:
 - i) Field applied or factory-built grease duct enclosure shall be installed per the latest manufacturer's installation instructions and in compliance with terms of its listing.
 - ii) All end cuts or cuts in the foil jacket of field applied grease duct enclosure shall be sealed per the manufacturer's recommendations.
 - iii) All installations shall be completely accessible for visual inspection.
 - iv) At time of inspection, the field applied or factory-built grease duct enclosure installation instructions shall be made available at the job site.

6) **CAPACITY OF NON-LISTED TYPE I HOOD (cfm)**

$$E(\text{NET})=E(\text{HOOD})-MA(\text{INTERNAL DISCHARGE})$$

- a) **EXTRA-HEAVY-DUTY COOKING APPLIANCE AIRFLOW** The minimum net airflow for hoods used for solid fuel cooking appliances such as charcoal, briquette, and mesquite to provide the heat source for cooking shall be in accordance with Table 508.5.1.2

**TABLE 508.5.1.2
EXTRA-HEAVY-DUTY COOKING APPLIANCE AIRFLOW**

TYPE OF HOOD	AIRFLOW (cubic foot per minute per linear foot of hood)
Backshelf/pass-over	Not permitted
Double island canopy (per side)	550
Eyebrow	Not permitted
Single island canopy	700
Wall-mounted canopy	550

For SI units: 1 cubic foot per minute = 0.00047 m³/s, 1 foot = 304.8 mm

- b) **HEAVY-DUTY COOKING APPLIANCE AIRFLOW** The minimum net airflow for hoods used for cooking appliances such as gas under-fired broilers, gas chain (conveyor) broilers, electric and gas wok ranges, and electric and gas-fired (upright) boilers to provide the heat source for cooking shall be in accordance with Table 508.5.1.3.

**TABLE 508.5.1.3
HEAVY-DUTY COOKING APPLIANCE AIRFLOW**

TYPE OF HOOD	AIRFLOW (cubic foot per minute per linear foot of hood)
Backshelf/pass-over	400
Double island canopy (per side)	400
Eyebrow	Not permitted
Single island canopy	600
Wall-mounted canopy	400

For SI units: 1 cubic foot per minute = 0.00047 m³/s, 1 foot = 304.8 mm

- c) **MEDIUM-DUTY COOKING APPLIANCE AIRFLOW** The minimum net airflow for hoods used for cooking appliances such as electric and gas hot-top ranges, electric and gas flat griddles, electric and gas double sided griddles, electric and gas fryers and electric and electric and gas conveyor pizza ovens shall be in accordance with Table 508.5.1.4.

**TABLE 508.5.1.4
MEDIUM-DUTY COOKING APPLIANCE AIRFLOW**

TYPE OF HOOD	AIRFLOW (cubic foot per minute 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 units: 1 cubic foot per minute = 0.00047 m³/s, 1 foot = 304.8 mm

- d) **LIGHT-DUTY COOKING APPLIANCE AIRFLOW** The minimum net airflow for hoods used for cooking appliances such as electric and gas ovens (including standard, bake, roasting, revolving, retherm, convection, combination convection/steamer, rotisserie, countertop conveyORIZED baking/finishing, deck, and pastry), discrete element ranges, electric and gas steam-jacketed kettles less than 20 gallons, electric and gas pasta cookers, electric and gas steamers, electric and gas cheesemelters, electric and gas tilting skillets, electric and gas rotisseries, and electric and gas salamanders shall be in accordance with Table 508.5.1.5

**TABLE 508.5.1.5
LIGHT-DUTY COOKING APPLIANCE AIRFLOW**

TYPE OF HOOD	AIRFLOW (cubic foot per minute 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 units: 1 cubic foot per minute = 0.00047 m³/s, 1 foot = 304.8 mm

EXCEPTION: Listed exhaust hoods are to be installed in accordance with the terms of their listings and the manufacturer's installation instructions.

7) LISTED GREASE HOODS:

- a) Provide manufacturers name and model number on the plans.
- b) Indicate listing number on the plans (i.e. MH# or ETL#).
- c) Provide grease hood system plans drawn by the manufacturer indicating hood dimensions, exhaust volume, and make-up air requirements for the type of cooking equipment proposed.
- d) Note on plans that listed grease hood assemblies shall be installed in accordance with the terms of their listing and the manufacturer's installation instructions.
- e) Provide copy of manufacturer listing indicating hood or grease removal device is listed for reduced clearance to combustible materials.

8) MAKEUP AIR

- a) Each room provided with an exhaust system shall have air supplied to the room equal to the amount of air to be exhausted. Sec 511.3.1
- b) The exhaust and makeup air systems shall be connected by an electrical interlocking switch.

NOTE: If a portion of the makeup air is obtained from an a/c system (or other source) the source must also be interlocked with the respective exhaust system.

- c) Compensating hood replacement air introduced directly into the hood cavity shall not exceed 10% of exhaust air. Sec 511.3

9) ADDITIONAL ITEMS

- a) Please indicate the following notes on the plans:
 - i) Fire Department approval shall be required on fire protection system for grease hoods and ducts as required by Section 513 of the California Mechanical Code and as required by the Fire Code.
 - ii) All fire-extinguishing systems without system supervision shall be interconnected to the fuel or current supply so that the fuel or current is automatically shut off to all equipment under the hood when the system is activated. Sec 513.7-24
 - iii) Owner of establishment shall be responsible for cleanliness, maintenance, and inspection of kitchen exhaust system, fire protection, and cooking equipment. Sec 507.2.2-(2)

- iv) A drawing of the exhaust system(s) installation along with a copy of operating instructions for subassemblies and components used in the exhaust system(s), including electrical schematics, shall be available on the premises. Sec 507.5
- v) All seams, joints, and penetrations of the hood enclosure that direct and capture grease-laden vapors and exhaust gases shall have a liquid tight continuous external weld to the lower outermost perimeter of the hood. Sec 510.5.3
- vi) Prior to the use or concealment of a portion of a grease duct system, a leakage test shall be performed to determine that all welded joints and seams are liquid tight. Sec 510.5.63.1
- vii) Performance, capture and containment tests shall be performed upon installation before final. Test data and performance test results shall be displayed and be available upon request. Sec 511.2.2.1 & 511.2.2.2
- viii) Hood exhaust fan shall continue to operate after the extinguishing system has been activated, unless fan shutdown is required by a listed component of the ventilation system. Sec 511.2.3
- ix) Type I hoods shall bear a label indicating the exhaust flow rate in cubic feet per minute per lineal foot. Sec 508.5.3
- x) Licensed airflow contractor shall provide grease exhaust system air balance report to inspector prior to final.
- b) Duct system should be installed so grease cannot be pocketed. The system shall slope not less than ¼" per foot toward the hood or toward the grease reservoir. (Where horizontal ducts exceed 75' in length the slope shall be minimum 1" per foot (8% slope)). Drains to be provided at all low points. Sec 510.1.3
- c) Utility set exhaust fan shall be manufactured with an approved drain outlet at the bottom of the housing to permit drainage of grease to a readily accessible noncombustible container. Sec 511.1.3.1
- d) It appears from plans that a portion of grease duct system has sections inaccessible from duct entry or discharge. Please provide openings in compliance with section 510.3 of the California Mechanical Code.
- e) In-line fans shall be connected to the exhaust duct by flanges. Please provide detail in compliance with section 511.1.2 of the California Mechanical Code.

10) NONCANOPY TYPE HOODS: In addition to all code requirements for a canopy type hood please comply with one of the following requirements:

- a) Noncanopy-type cooking hoods shall be installed with the edge of the hood not more than 1 foot from edge of the cooking surface and the vertical distance between the lip of the hood and the cooking surface shall not exceed 3 feet. Sec 508.5.2.1
- b) In addition to other requirements for hoods the volume of air exhausted shall not be less than 300 cfm per lineal foot of cooking equipment. EXCEPTION: Listed hood assemblies designed and installed specifically for the intended use. with the terms of their listing and the manufacturer's installation instructions. Sec 508.5.2.2

11) TYPE II HOODS: ~~Ho~~-Hoods are also required over equipment and dishwashers that generate steam, heat, and products of combustion, and where grease or smoke is not present. Sec 519.1 Exception 1: Dishwashing machines directly connected to a Type II duct system. Exception 2: Self-contained condensing system listed per UL921

a) For Type II hoods indicate the following:

- i) Indicate material and thickness of hood (min. 24 ga. steel) Sec 519.2
- ii) Indicate material and thickness of duct. (Per Chapter 6 of Mechanical Code) Sec 519.4
- iii) Capacity of hood (cfm) as calculated below:
 - (1) Minimum required exhaust air (cfm) used for dishwashing equipment shall be not less than 200 cfm per linear foot of hood length. Sec 519.3
 - (2) Minimum exhaust for hoods over ovens shall be based on LIGHT DUTY COOKING APPLIANCE AIRFLOW Table 508.405.1.5 of the California Mechanical Code
 - (3) Exhaust for ovens shall be based on manufactures installation requirements.

12) SOLID FUEL COOKING EQUIPMENT Solid Fuel Cooking Equipment installations shall comply with Section 517.0 of the Mechanical Code. Provide complete details to verify compliance.

13) ENERGY EFFICIENCY REQUIREMENTS

- a) Kitchen facilities having total Type I and Type II kitchen hood exhaust airflow rates greater than 5,000 cfm, each Type I hood shall have an exhaust rate that complies with TABLE 140.9-A. EXCEPTION: If 75% of the total Type I and Type II exhaust replacement air is transfer air that would otherwise be exhausted.
- b) Mechanically cooled or heated makeup air delivered to any space with a kitchen hood shall not exceed the greater of:
 - i) The supply flow required to meet the space heating and cooling load; or
 - ii) The hood exhaust flow minus the available transfer air from adjacent spaces. Available transfer air is that portion of outdoor ventilation air serving adjacent spaces not required to satisfy other exhaust needs, such as restrooms, not required to maintain pressurization of adjacent spaces, and that would otherwise be relieved from the building.
- c) A kitchen/dining facility having a total Type I and Type II kitchen hood exhaust airflow rate greater than 5,000 cfm shall have one of the following:
 - i) At least 50 percent of all replacement air is transfer air that would otherwise be exhausted; or
 - ii) Demand ventilation system(s) on at least 75 percent of the exhaust air. Such systems shall:
 - (1) Include controls necessary to modulate airflow in response to appliance operation and to maintain full capture and containment of smoke, effluent and combustion products during cooking and idle; and

- (2) Include failsafe controls that result in full flow upon cooking sensor failure; and
- (3) Include an adjustable timed override to allow occupants the ability to temporarily override the system to full flow; and
- (4) Be capable of reducing exhaust and replacement air system airflow rates to the larger of:
 - (a) 50 percent of the total design exhaust and replacement air system airflow rates; or
 - (b) The ventilation rate required per Section 120.1.
- iii) Listed energy recovery devices with a sensible heat recovery effectiveness of not less than 40 percent on at least 50 percent of the total exhaust airflow; or
- iv) A minimum of 75 percent of makeup air volume that is:
 - (1) Unheated or heated to no more than 60°F; and
 - (2) Uncooled or cooled without the use of mechanical cooling.
- d) Provide all parts of PROCESS COMPLIANCE FORM 2019-NRCC-PRC-E on the plans.

14) ADDITIONAL CORRECTIONS: The following corrections must be addressed for plan approval.
