

hvacr designer tips

BY AMANDA McKEW



KITCHEN Hood Exhaust (DUCTED, COMMERCIAL)

✓ DRAWING CHECKLIST

- | Done | N/A |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> Designate equipment on drawing [e.g., exhaust fan (EF#) or kitchen make-up air unit (MAU-#)]. |
| <input type="checkbox"/> | <input type="checkbox"/> Show and note size of ductwork connections to equipment. |
| <input type="checkbox"/> | <input type="checkbox"/> Schedule and specify equipment in construction documents. |
| <input type="checkbox"/> | <input type="checkbox"/> Coordinate electric data (e.g., exhaust fan, make-up air units, VSD) locations with electrical engineer. |
| <input type="checkbox"/> | <input type="checkbox"/> Coordinate plumbing data (floor drains, water make-up, gas) with plumbing engineer. |
| <input type="checkbox"/> | <input type="checkbox"/> Coordinate fire protection data (e.g., fire suppression) with fire protection engineer. |
| <input type="checkbox"/> | <input type="checkbox"/> Coordinate structural data (e.g., weights, roof penetrations) with structural engineer. |
| <input type="checkbox"/> | <input type="checkbox"/> Check access around equipment (section needed?). |
| <input type="checkbox"/> | <input type="checkbox"/> Show required cleanout(s) in duct route per code. |
| <input type="checkbox"/> | <input type="checkbox"/> Show required drain piping. |
| <input type="checkbox"/> | <input type="checkbox"/> Indicate reference to applicable detail on drawing. |
| <input type="checkbox"/> | <input type="checkbox"/> Indicate control devices on detail. |

✓ DESIGN CHECKLIST

- | Done | N/A |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> Base layout on one-line diagram. |
| <input type="checkbox"/> | <input type="checkbox"/> Coordinate sequence of operation with flow diagram. |
| <input type="checkbox"/> | <input type="checkbox"/> Include fan curve in job folder. |
| <input type="checkbox"/> | <input type="checkbox"/> Include static pressure calculations in job folder. |
| <input type="checkbox"/> | <input type="checkbox"/> Coordinate electric data with electrical engineer. |
| <input type="checkbox"/> | <input type="checkbox"/> Coordinate plumbing data with plumbing engineer. |
| <input type="checkbox"/> | <input type="checkbox"/> Coordinate structural data with structural engineer. |
| <input type="checkbox"/> | <input type="checkbox"/> Coordinate kitchen data with kitchen consultant. |
| <input type="checkbox"/> | <input type="checkbox"/> Design exhaust ductwork air velocity at 1,500 to 2,200 fpm. |
| <input type="checkbox"/> | <input type="checkbox"/> Provide duct cleanouts per code. |
| <input type="checkbox"/> | <input type="checkbox"/> Provide approximately the equal amount of make-up air while air is exhausted by kitchen exhaust system (directly to hood or to space as seen in photo). |
| <input type="checkbox"/> | <input type="checkbox"/> Make sure ductwork construction is of steel or stainless steel and per code. |
| <input type="checkbox"/> | <input type="checkbox"/> Allow no ductwork low points from the hood to the fan. |
| <input type="checkbox"/> | <input type="checkbox"/> Provide a point of collection for the grease at the base of each vertical ductwork rise. |
| <input type="checkbox"/> | <input type="checkbox"/> Coordinate duct sizes and transitions to kitchen hood equipment cuts. |
| <input type="checkbox"/> | <input type="checkbox"/> Enclose ducts penetrating fire-rated assembly (floor/shaft) in fire resistance-rated shaft with a minimum of 6 in. between the shaft and the duct. |

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|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> When using a kitchen supply air make-up unit with exhaust, provide with: |
| <input type="checkbox"/> | <input type="checkbox"/> • Factory-mounted disconnect, modulating control (gas) valve, discharge air temperature (DAT) sensor, inlet air sensor, weatherhood, motorized damper, control center, filters, duplex receptacle, and interlock with associated hood. |
| <input type="checkbox"/> | <input type="checkbox"/> • Fresh air intake must be 10 ft from any exhaust discharge. |
| <input type="checkbox"/> | <input type="checkbox"/> • Access to equipment for maintenance (e.g., filters). |
| <input type="checkbox"/> | <input type="checkbox"/> • If using a dedicated kitchen exhaust fan, the motor must be out of the airstream. |
| <input type="checkbox"/> | <input type="checkbox"/> • Roof-mounted exhaust discharge charge to be upblast, avoiding grease buildup on roof. |
| <input type="checkbox"/> | <input type="checkbox"/> Complete design intent document. |
| <input type="checkbox"/> | <input type="checkbox"/> Complete prefunctional performance test (startup) sheet(s). |
| <input type="checkbox"/> | <input type="checkbox"/> Complete functional performance test procedure(s). |
| <input type="checkbox"/> | <input type="checkbox"/> Refer to "Back to Basics" tests for additional control and commissioning parameters. |

✓ VALUE ENGINEERING TIPS

- | Done | N/A |
|--------------------------|-------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> Base system selection analysis on <i>ASHRAE 2001 Systems Handbook</i> (Chapter 1). |
| <input type="checkbox"/> | <input type="checkbox"/> Specify premium-efficiency motors with ROI. |
| <input type="checkbox"/> | <input type="checkbox"/> Specify VSD with ROI. |
| <input type="checkbox"/> | <input type="checkbox"/> Consider energy-recovery options. |

REFERENCES

ASHRAE 1999 HVAC Applications Handbook (Chapter 30, Kitchen Ventilation).

ICC International Mechanical Code 2000:

- Section 506, "Commercial Kitchen Grease Ducts and Exhaust Equipment."
- Section 507, "Commercial Kitchen Hoods."
- Section 508, "Commercial Kitchen Makeup Air."

BOCA Mechanical Code, Chapter 5, "Kitchen Exhaust Equipment."

"HVACR Designer Tips," August 1998: Upblast Roof Exhaust Fan.

If you have any comments, suggestions, or questions regarding this designer check list, contact Amanda McKew at amckew@rdkimball.com. This column is meant to provide some basic guidelines for good design. Always consult all necessary codes and resources relevant to each particular project.

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ENGINEERS