

## Field Guide - FY18 Addendum

*The sections contained in this document supersede the sections in the published FY17 Field Guide.*

### 2.5.3 Floor Insulation

Prior to insulating the floor, take all appropriate measures to establish an effective air barrier at the floor to prevent air from passing through or around floor insulation.

#### Insulating Open Floor Cavities

Install a ground-moisture barrier that runs up the foundation walls at least six inches in crawl spaces. Seal the ground-moisture barrier to the foundation wall with appropriate material. Overlap the seams of the ground moisture barrier a minimum of 12 inches with “reverse” or “upslope lapping” technique (e.g., overlapping so water will not flow in between the seams).

**Caution:** Moisture barriers are typically for use in crawl spaces. In basements, restrict their use to basements with dirt floors and limited access. If the ground-moisture barrier is installed in a seldom-used basement, install walk boards to prevent residents from slipping. Problems such as plumbing leaks or bad site drainage must be addressed prior to installing the barrier, to avoid water pooling on or under the barrier.

### 3.4.1 Duct System Modification

If adjusting the fan speed and other minor improvements do not bring the temperature rise within manufacturer’s specifications, duct work modifications may be considered.

Ductwork runs installed to provide heat to individual spaces shall be as short as possible. The placement of a register shall be where it is least likely to be blocked by furniture or other obstacles.

If possible, a single return air grill shall be provided with the shortest ductwork run possible to a central location on the main floor that is heated. If another floor is heated that can be closed off from the main floor, an additional return air grill may be installed with the shortest ductwork run possible to a central location. This may not apply to a basement when back-drafting or other health and safety risks or efficiency issues are present.

1. Design new ducts in accordance with ANSI/ACCA Manual D and manufacturer's specifications.
2. Design terminations in accordance with ANSI/ACCA Manual T and manufacturer's instruction.
3. Do not add supply registers to the combustion-appliance zone (CAZ) unless it is an intentionally heated space. Consult with the customer about removing existing grills in the CAZ. If grills are removed, document the customer consultation in the file.
4. Mechanically fasten supply and return ductwork with screws.
5. Do not install new ductwork in unconditioned spaces unless necessary. If ducts are located in unconditioned spaces, seal the joints and insulate the ducts to a minimum R-11.
6. Connect new ducts to the existing distribution. Install balancing damper in each new branch supply duct. Install registers to terminate each new supply or return branch duct.

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7. Do not use building spaces, like basements or crawl spaces, as a plenum or duct.

### 3.4.2 Duct Leakage

Leaky duct work poses multiple problems: it may affect the occupant's health and safety, comfort, and the energy consumption of the home.

Seal all heating and cooling duct work that runs outside the dwelling envelope, as these ducts waste energy and introduce health and safety hazards.

In the CAZ, return-ductwork leakage causes depressurization and increases the possibility of natural-drafting appliances back-drafting. Supply-side leaks in the CAZ are less likely to cause backdrafts; rather, they may add in the appliances' natural draft by adding positive pressure to the room.

Duct leakage that occurs inside the heated envelope is less likely to contribute to increased energy consumption. Supply duct leakage can introduce excessive moisture into unheated spaces and depressurize the CAZ. Return duct leakage into unheated spaces can draw pollutants into the distributed air causing health issues for the occupants in living areas of the home.

Follow these instructions when sealing ductwork:

1. Seal return and supply ducts located outside the thermal boundary.
2. Seal all observed or detected leaks between the furnace and the return drop.
3. Seal all gross holes (5/32" or larger) and repair/replace missing ducts in the return and supply ducts.
4. Seal return and supply leaks as needed based on guidance in the Diagnostic Workbook.
5. Flex Ducting: Pull the flex-duct liner up onto the metal duct as far as possible before securing the interior liner of the flex-to-metal connection. Fasten the connection with tie-bands, using a tie-band-tensioning tool or a mechanical band

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### Track Changes Version

#### 2.5.3 Floor Insulation

Prior to insulating the floor, take all appropriate measures to establish an effective air barrier at the floor to prevent air from passing through or around floor insulation.

#### Insulating Open Floor Cavities

Install a ground-moisture barrier that runs up the foundation walls at least six inches in crawl spaces. Seal the ground-moisture barrier to the foundation wall with appropriate material. ~~and seal all seams and penetrations as well.~~ Overlap the seams of the ground moisture barrier a minimum of 12 inches with “reverse” or “upslope lapping” technique (e.g., overlapping so water will not flow in between the seams).

**Caution:** Moisture barriers are typically for use in crawl spaces. In basements, restrict their use to basements with dirt floors and limited access. If the ground-moisture barrier is installed in a seldom-used basement, install walk boards to prevent residents from slipping. Problems such as plumbing leaks or bad site drainage must be addressed prior to installing the barrier, to avoid water pooling on or under the barrier.

#### 3.4.1 Duct System Modification

If adjusting the fan speed and other minor improvements do not bring the temperature rise within manufacture’s specifications, duct work modifications may be considered. Ductwork runs installed to provide heat to individual spaces shall be as short as possible. The placement of a register shall be where it is least likely to be blocked by furniture or other obstacles.

If possible, a single return air grill shall be provided with the shortest ductwork run possible to a central location on the main floor that is heated. If another floor is heated that can be closed off from the main floor, an additional return air grill may be installed with the shortest ductwork run possible to a central location. This may not apply to a basement when back-drafting or other health and safety risks or efficiency issues are present.

1. Design new ducts in accordance with ANSI/ACCA Manual D and manufacturer's specifications
2. Design terminations in accordance with ANSI/ACCA Manual T and manufacturer's instruction
3. Do not add supply registers to the combustion-appliance zone (CAZ) unless it is an intentionally heated space. Consult with the customer about removing existing grills in the CAZ. If grills are removed, document the customer consultation in the file.
4. Mechanically fasten supply and return ductwork with screws. ~~Seal the ductwork to the furnace cabinet with mastic and fabric mesh tape, caulk, or other UL-181 approved material, to form an essentially airtight connection on all sides of these joints.~~
5. Do not install new ductwork in unconditioned spaces unless necessary. If ducts are located in unconditioned spaces, seal the joints and insulate the ducts to a minimum R-11.
6. Connect new ducts to the existing distribution. Install balancing damper in each new branch supply duct. Install registers to terminate each new supply or return branch duct.
7. Do not use building spaces, like basements or crawl spaces, as a plenum or duct.

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### 3.4.2 Duct Leakage

Leaky duct work poses ~~two problems~~ multiple problems: it may affect the occupant's health and safety, comfort, and the energy consumption of the home.

Seal all heating and cooling duct work that runs outside the dwelling envelope, as these ducts waste energy and introduce health and safety hazards. ~~For example, leaky supply ducts can introduce excessive moisture into unheated spaces, and depressurize the home. When return ducts leak in unheated spaces, they may serve to draw pollutants into the distribution stream of air.~~

In the CAZ, return-ductwork leakage causes depressurization and increases the likelihood possibility of natural-drafting appliances ~~will backdraft~~ back-drafting. Supply-side leaks in the CAZ are less likely to cause backdrafts; rather, they may add in the appliances' natural draft by adding positive pressure to the room.

Duct leakage that occurs inside the heated envelope is less likely to contribute to increased energy consumption. ~~The leakage; however, may; lead to an unintentional and uneven distribution of heat throughout the home, with less hot air distributing to the room where the occupants spend much of their time.~~ Supply duct leakage can introduce excessive moisture into unheated spaces and depressurize the CAZ. Return ducts leak into unheated spaces can draw pollutants into the distributed air causing health issues for the occupants in living areas of the home.

Follow these instructions when sealing ductwork:

~~1. After completing Steps 2-5, follow the Diagnostic Workbook to guide further sealing.~~

1. Seal return and supply ducts located outside the thermal boundary

~~2. If needed, prepare duct surfaces according to the product manufacture specifications.~~

2. Seal ~~the connection~~ all observed or detected leaks between the furnace and the return drop.

3. Seal all gross holes (5/32" or larger) and repair/replace missing ducts in the return and supply ducts

~~4. Seal the connection between the furnace and the supply plenum, as well as the connection between the furnace and the return drop.~~

4. Seal return and supply leaks as needed based on guidance in the Diagnostic Workbook

~~5. Seal all gross holes in the supply and return ductwork.~~

5. Flex Ducting: Pull the flex-duct liner up onto the metal duct as far as possible before securing the interior liner of the flex-to-metal connection. Fasten the connection with tie-bands, using a tie-band-tensioning tool or a mechanical band

~~6. Consider temporarily removing joist panning along the building's exterior, to investigate or air infiltration into the duct system. Replace joist panning when investigation is complete.~~

~~7. Flex ducting: Pull the flex-duct liner up onto the metal duct as far as possible before securing the interior liner of the flex-to-metal connection. Fasten the connection with tie-bands, using a tie banding tool or a mechanical band.~~