

City of Killeen

Building Inspections Division

Mechanical Equipment and Appliance Sizing Reminders.

- **Mandatory.** Section N 1103.7 of the IRC and Section R403 of the IECC both declares mandatory that all Heating and Cooling equipment to be sized in accordance with **ACCA Manual S** based upon the building loads calculated in accordance with **ACCA Manual J** or other *approved* calculation methodologies. These requirements have been in the code since the 2015 versions (starting in Killeen on January 1, 2016).

In 2016, the city of Killeen moved towards compliance by requiring a copy of the **Manual J** summary report. Going forward, effective June 1, 2020, we now will also be requiring a copy of the summary **Manual S** for the equipment selected for the project during the plan review of new construction and for equipment change outs unless the equipment change out is “like for like” (Example changing a 3 ton for a 3 ton).

Our purpose is to ensure the minimum requirements of the residential construction code (2018 IRC) and the energy code (2018 IECC) are complied with and please note that these codes are also state adopted (2015 versions).

Below is a simple check list for major items we will be looking for during plans review:

- **Indoor design temperatures.** The standard indoor temperatures are **70° F** for heating and **75° F** for cooling (with **50%** relative humidity).
- **Outdoor design temperatures.** *Per appendix D in the 2018 IPC*, **26-28° F** for winter and **98-99° F** for summer. We will not accept outdoor design temperatures higher than **30° F** for winter or **100° F** for summer.
- **Areas.** When the designer enters the various floors, walls, ceilings, windows, and doors, having the wrong areas can make a big difference. This is especially true for parts of the building enclosure that have worse specifications, like windows. A code-built house in IECC climate zone 2, for example, has windows with U-Factor of 0.40 which equals about R-2.5, whereas the walls will be R-13. Entering too much window area will overinflate the load. Entering too much of any of the areas likewise inflates the load. The overall building area shall not be more that 10% difference from the living square footage area listed on the permit application.
- **R-values and U-values.** Check the entries for the floors, walls, ceilings, and floors to ensure the designer put in the correct R-values (for insulation) and U-values (for assemblies, like windows).
- **The number of occupants.** Adding extra occupants will over inflate the load. The design rule is the number of occupants should equal the number of bedrooms plus one.
- **Infiltration.** If you're building a new house and meeting a code that requires five air changes per hour at 50 Pascals (ACH50) or better, the *Construction Quality* entry should be "tight" or "semi-tight." (Note: we will not accept “average” for a new house.

- **Orientation.** The software gives the designer the option of using the worst case for the orientation. Your load calculation should have the correct orientation, or you'll end up with extra load in your reports.
- **Duct location.** If the ducts are in conditioned space or an encapsulated attic or crawl space, make sure that gets factored in properly. Doing the load calculations for ducts in an unconditioned attic will result in excess load.
- **Equipment specified.** The make and model number of the equipment must be specified. Note: we will not accept summary sheets if the equipment specified is not entered in.

- **Square feet per ton.** Most new homes, even in hot climates, have loads of 800 square feet per ton or more. This means that a contractor using 500 square feet per ton is installing an air conditioner that could be 2 or 3 times larger than it should be.