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On the 2019 Residential 45-day Language

Additional submitted attachment is included below.

Some comments on the 2019 Residential 45-day Language:

Subchapter 7

Section 150.0 (h) - NOTE: - references Furnace output capacity listing in the Appliance Directory as having to meet or exceed the building heating load at winter design conditions. One would assume this would also refer to the Heat Pump output capacity listed in the Appliance Directory for Small Residential air source Heat Pumps. However, that listed number is not useful. A Heat Pump's heating capacity needs to be calculated using the units output at 45 & 17 degrees, and the location's winter design temperature. If the **calculated** output, including supplemental electric resistance heat, meets or exceeds the required winter design heating load, the equipment meets the Mandatory sizing requirements.

Note that there is no Code required minimum cooling capacity required. However, the Commission should require the installer to also disclose the cooling performance at the Summer Design Temperature, so that the homeowner has the opportunity to query the installer as to the adequacy of the proposed equipment. The Appliance Directory does not include heating capacity at 47 and 17 degrees for these small residential heat pumps, which would be required to calculate the units heating performance. It is the responsibility of the installing contractor to select a unit that will satisfy the heating load, utilizing equipment that meets, or exceeds, the heating & cooling efficiencies defined in the CF-1R.

Section 150.0 (j)2 - Exception 2, Plastic/PEX piping penetrating metal framing should also have grommets etc. to protect those pipes from possible abrasion/failure.

Section 150.0(m) 12A.i. - Is the 10-foot length for the entire duct system including return, the entire duct system excluding return ducts, or the length of any duct branches that exceed 10 feet each?

150.0 (o) 1. C. D. & F. - I am not sure of the distinctions between Dwelling Unit types. For instance, if I have a 2-story building where the 1st story is Commercial and the 2nd story are apartments. Are the apartments "multifamily" or "horizontally attached single family dwellings? This needs to be clarified.

Subchapter 8

Section 150.1 (b) 3. B. – If a Furnace is required to have a higher than minimum AFUE for Performance compliance, that should also require field verification. The same applies for Water Heaters that require higher than minimum efficiencies to comply.

Section 150.1 (b) 3. B. v. – When modeling a heat pump for 2019 Performance compliance the modeler has 2 choices. One is to input specific 47 & 17 deg. outputs. The other, is to have the program select these inputs internally. When selected internally, these outputs are not reported and therefore do not need verification. Verifying these outputs when manually input is an unnecessary and misleading exercise. This is because the manually input equipment definition may result in an undersized unit. If undersized the program will model electric resistance heating sufficient to meet the space requirements. The proposed energy performance will be proportionally penalized for this additional energy use. Modeling an undersized heat pump with strip heat may still pass, in which case the building meets Performance requirements. If it does not pass, one could select a unit with a higher heating output to get compliance, or one could leave the heat pump alone and improve something else, like substituting a more efficient water heater. Other potential

problems with inputting specific 47 & 17 deg. outputs are that the modeled unit may be discontinued before the building is ready for installation or the installing contractor carries a different brand of heat pump. Telling a contractor that he or she cannot bid on a job because they do not carry Carrier heat pumps, for instance, would be considered Restraint of Trade.

This entry for “Heat Pump Rated Heating Capacity” should be eliminated.

In either case the Installing Contractor still needs to verify that the equipment installed will satisfy the required Winter Design heating load.

Section 150.1 (c) 2. - Radiant Barrier - How do I install a radiant barrier in a Cathedral Ceiling? Does this mean that I cannot use the Prescriptive Method on a building with a vaulted ceiling? (Currently, the Performance software will not allow me to model a radiant barrier in a Cathedral ceiling, it should).

Section 150.1 (c) 6. - EXCEPTION – What about Fireplaces and Wood Stoves etc.? This exception should only refer to Electric Resistance equipment.

TABLES 150.1 A & B – A maximum U factor of 0.30 may be OK for windows, but it is impossible to attain, and therefore not a cost-effective feature, in a residential skylight (without resorting to exotic materials like Aerogel insulation). There should be a separate Prescriptive requirement for residential skylights. I suggest an NFRC U-factor of 0.44.

Subchapter 9

Section 150.2 (a) 1. – EXCEPTIONS 1 & 2 from Section 150.2 (b) 1. A. (Alterations) should also be included in this (Additions) Section.

Appliance Directory

The most common HVAC equipment used for Commercial buildings in much of California are Packaged Rooftop Units (RTUs). Many of these utilize Gas for heating and Electricity for cooling. I have not been able to find any Category in the Directory that includes these Gas/Electric units. This category needs to be added and populated.

The “Small Air-Source Heat Pump” category needs to have the undefined “Heating Capacity (BTUH)” entry replaced with “Heating Capacity (BTUH) at 47 deg. F”, and “Heating capacity (BTUH) at 17 deg. F” so that one has the information needed to calculate the unit’s performance at the appropriate winter design temperature.

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