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### **SUBJECT: HVAC DESIGN**

All buildings should be analyzed by an HVAC professional to properly specify the heating, cooling and ductwork systems to ensure maximum performance and occupant comfort. Design factors to be considered include:

- Size of Building (each floor analyzed individually)
- Orientation of Building
- Type of Wall Construction (and associated R-value)
- Window information (number, location, insulation value, fenestration rating)
- Door information (number, location, insulation value, fenestration rating)
- Duct location (in heated space, in unheated space, in attic, in crawl space)
- Fireplaces (number, type)
- Air Infiltration

All these factors must be analyzed to provide a properly sized HVAC design. A rule of thumb approach is not suitable for HVAC design when high performance SIP envelope systems are used to enclose the structure.

A process for the accurate design of HVAC systems is available from the American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc. (ASHRAE). Detailed information on HVAC design is available in the ASHRAE Fundamentals Handbook. ASHRAE publishes the ASHRAE Manual J procedures which are used to design the HVAC system.

Premier SIPS provide inherent energy savings when used for walls and/or roof components on buildings. The energy savings can be attributed to two main factors:

1. Increased stable R-value due to the high performance rigid insulation core
2. Lowered air infiltration due to few and tighter joints in the envelope

Applying Manual J calculations provides for the increased R-value and the reduced air infiltration of buildings constructed with SIPs. These two factors will allow for down-sizing/right-sizing of the heating and cooling equipment. This will provide initial cost savings at the time of construction. In addition, right-sizing of the HVAC system will provide a more comfortable environment for the occupants.

Architects/engineers, builders, building owners and other building professionals have learned from experience that the energy savings for a well-built Premier SIPS structure can be 30 to 50%, or more.