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### **SUBJECT: ENERGY CALCULATIONS AND PREMIER SIPS**

HVAC professionals require substantiated design information to properly select the mechanical systems installed in Premier SIPS residential projects. HVAC professionals rely on ACCA (Air Conditioning Contractors of America) Manual J as the design guide to calculate the requirements for the heating and cooling systems in residential structures. These Manual J calculations are computer software based and have defaults for R-value and air changes per hour (ACH). However, if a proper evaluation of a home built with SIPs is to be accurate, the HVAC professional needs to manually input the following two factors to arrive at a meaningful result: Premier SIPS higher R-value and air tightness.

Manual J based calculations require the R-value of the insulation material and the air infiltration rate, or air leakage rate. The R-value of Premier SIPS needs to be manually inputted into Manual J calculations based on their Whole Wall R-value. Additionally, the air infiltration rate for Premier SIPS must be accounted for properly. Design guidelines for Manual J calculations suggest a reasonable air leakage assumption between 0.35 to 0.50 natural air-changes per hour at 50 pascals. This recommendation is for stick-built homes.

Premier Building Systems has blower door test data generated from homes using SIPs for the exterior walls and roof of homes that tested between .04 to .06 ACH. These SIP home ACH values are on the order of 10 times better than what the Manual J design guidelines suggest for natural air changes per hour.

Therefore, based on Premier SIPS achieving verified ACH test values between 0.04 to .06, Premier recommends that a value of .05 natural air changes per hour be used when performing Manual J heat loss calculations on homes using Premier SIPS as the exterior walls and roof. If the software being used does not allow for numerical input, select the tightest option possible.