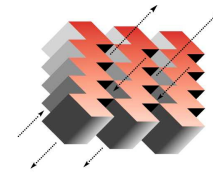


ARCHITECTURAL ENERGY C O R P O R A T I O N

Integrated Engineered Solutions

December, 2004



RE: REM/Rate™ and REM/Design™ Software Energy Code Compliance Capabilities

To whom it may concern:

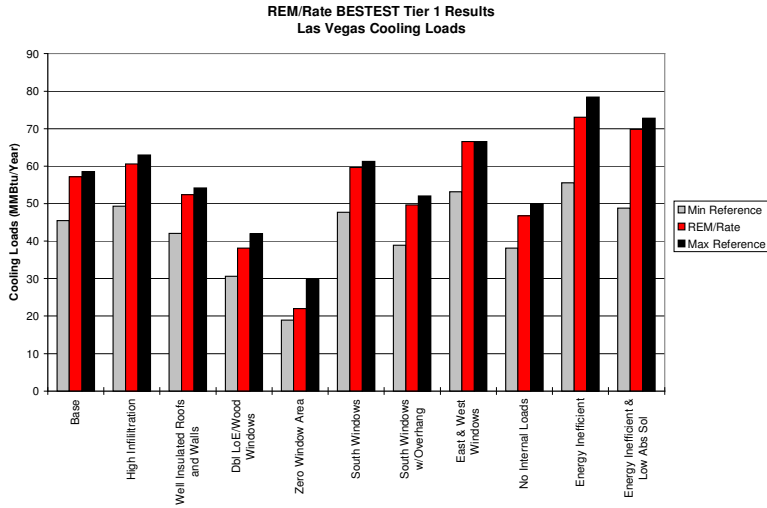
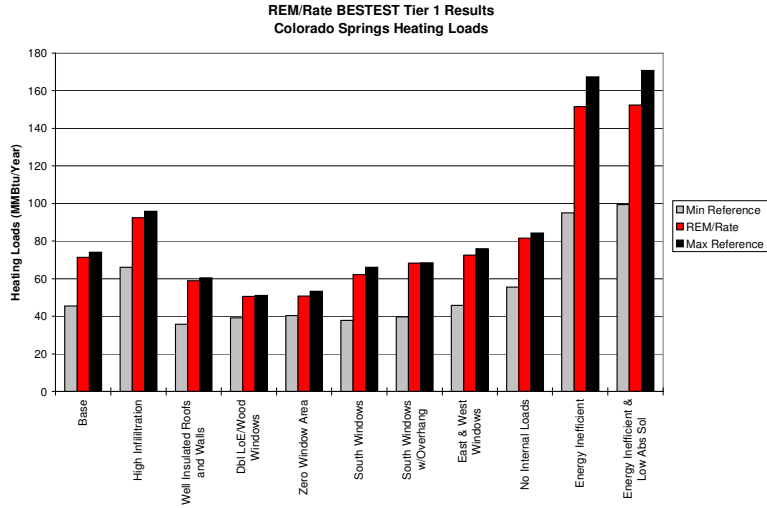
The REM/Rate and REM/Design home energy analysis software has been developed and maintained by Architectural Energy Corporation (AEC) since in 1985. REM/Rate is the most widely used home energy rating system (HERS) software in the country and is also used by numerous electric and gas utilities for various efficiency programs, including EPA's Energy Star Homes Program. REM/Design is currently in use at the National Association of Homebuilders' National Research Center and by hundreds of homebuilders, designers, researchers, weatherization agencies, and manufacturers throughout the country. The REM methodology for calculating annual energy consumption in residential buildings is based on SERI/RES, detailed and widely validated building energy simulation software, developed at the Solar Energy Research Institute (now National Renewable Energy Lab or NREL) in the early 1980s.

Both REM/Rate and REM/Design produce code compliance reports for the 1992, 1993, and 1995 Model Energy Codes and the 1998, 2000, 2001, 2003 and 2004 International Energy Conservation Code. Reports are available to show compliance via the Chapter 4 (Systems Analysis) and Chapter 5 (Component Performance) approaches.

The Chapter 5 compliance report, called the *Uo Compliance Report* in the REM software, is self-contained. That is, all of the data needed to calculate the overall Uo of the home is presented on the report. Thus, the calculation of the overall Uo can be verified with a hand calculation. The Chapter 4 compliance report, call the *Performance Compliance Report* in the REM software, is based on a simulation of the annual energy use of the home, both for the proposed design, and a standard home as outlined in Chapter 4.

Over the years, AEC has been an active proponent of developing a procedure to verify the accuracy of energy code compliance software. We have been in contact with numerous organizations including CABO (now the ICC) and the U.S. Department of Energy (DOE), in an attempt to generate interest in developing a means for obtaining such verification. Unfortunately, no energy code compliance evaluation method currently exists.

Several years ago, DOE through the Home Energy Rating System Council, developed voluntary technical guidelines for the HERS industry. As a part of those guidelines, the National Renewable Energy Laboratory developed the HERS Building Energy Simulation Test (BESTEST) which all software used by accredited HERS Providers must pass in order to meet the guidelines laid out by the HERS Council. To pass the HERS BESTEST, the tool in question must produce accurate annual heating and cooling loads for a number of runs designed to test the limits of the tool. The following graphs show that the REM software passes the HERS BESTEST.



AEC has spent a substantial amount of time and money understanding the codes for which our software provides compliance reports. When interpretive questions arise, authoritative sources are contacted so that sound decisions can be made. We have worked closely with the MEC and IECC technical committees, the Building Energy Standards Program at Pacific Northwest National Laboratory, and the Building Code Assistance Project to ensure that the MEC and IECC requirements and assumptions have been faithfully and correctly implemented in the REM software.

The thousands of REM software users throughout the country are testament to its reliability and accuracy. Every effort has been made to ensure the energy codes have been faithfully and accurately implemented in the software. However, if you should need further information regarding the code compliance capabilities of AEC's REM software, feel free to contact me.

Sincerely,

David R. Roberts, P.E.
Senior Engineer