



July, 27th 2006

Rod Hudler
Energy Efficiency Division
California Energy Commission
1516 9th Street.
Sacramento, California 95814-5512

SUBJECT-----Structured Plumbing Systems for Title-24

Rob;

Since 1992 when Demand Pumping Systems were first included into the Title-24 codes as an energy credit for residential new construction, there have been many studies and articles on the subject. In every case there has never been a negative shown with the use of Demand Pumping Systems. Studies conducted and articles written by the California Energy Commission, Davis Energy Group, Oak Ridge National Laboratories, LBL, the National Association of Home Builders Research Center, Masco EFL/ Build America and on the water side Aquacraft Inc., in most every cases the studies have shown both water and energy savings. In some cases there were questions as to the savings but no data that indicated a loss of water or energy. From the consumer's point of view, the Demand Pumping Systems were a 100 percent convenient and reliable product. In fact, Demand Pumping Systems installed over 12 years ago are still operating successfully in the homes as reported by the consumers.

In the last few years, a new concept called "STRUCTURED PLUMBING" has been introduced which is built on the success of the Demand Pumping Systems. Structured Plumbing includes a properly configured and located main trunk line (usually with a dedicated return line), small volume lines serving individual fixtures, insulation on all hot water piping and a Demand Pumping System to prime the main circulation loop shortly before a hot water draw. Structured Plumbing takes advantage of the research (drawing extensively on that conducted by the Energy Commission) that has been done that shows how to improve the energy and water performance of hot water distribution systems. We have been sharing guidelines for specifying Structured Plumbing Systems with builders and plumbers around the country that explain how to install these systems properly.

The latest report issued by the Environmental Protection Agency Energy Star for Homes called “Estimating Potential Hot Water Savings from Demand Controlled Pumping Systems and Structured Plumbing Layouts” indicates that the energy factor enhancement coefficient is between 27 and 41 percent for gas water heaters (based on a 30 percent reduction in water consumption). The report shows how the **energy factor enhancement coefficient** was developed. This coefficient can be multiplied by a water heater’s DOE energy factor to calculate an **enhanced effective water heater energy factor**. The test experiments cited, along with the analytical considerations support the substantial percentage of hot water savings associated with demand controlled pumping systems and structured plumbing layouts in homes. The EPA algorithm may be useful to the Energy Commission. In addition to describing the savings for Structured Plumbing, the EPA report also identifies the savings when Demand Controlled Pumping Systems are installed on trunk and branch systems in both new construction and in retrofit and when they are used to replace existing circulation pumps.

The EPA report and guidelines for installing Structured Plumbing systems are attached.

Thank you for considering the inclusion of Structured Plumbing in the Title-24 building energy efficiency standards. Please contact me if you have any questions or need additional information.

Sincerely,
ACT, Inc.

Larry Acker, CEO