

Best Practices – Sidewall Density

Date: Revised January 3, 2017

Subject: Sidewall Density

Problem or Question: How do we determine if the contractor dense packed the sidewalls to the proper density? (3.25-3.75lbs/cubic ft for cellulose; 1.75lbs/cubic ft for fiberglass)

Discussion: Randomly re-drilling walls during a final inspection is just one way to check sidewall insulation density, but it does not provide the density amount. Use of an Infrared camera can indicate if the wall cavity is full, but not the density. Both of these back end inspection techniques are highly recommended for Subrecipients to perform at the final inspection; as well as by Department inspectors. Is there a mathematical way to determine the proper achievement of dense pack work? There is, and it is fairly simple to calculate.

Sidewalls are constructed generally with a frame that consists of 2x4's; excluding masonry walls. Interior sidewalls are generally plaster, lathe or drywall. Achieving a dense pack with any type of wall has its challenges.

One of the most important factors is equipment and expertise:

- Does the contractor have a pneumatic machine designed to achieve the proper density?
- Is the contractor properly trained on techniques to achieve a proper dense pack?
- Does the contractor have the knowledge to adjust the airflow, material feed and an assortment of tubes to allow for adjustments on the job?
- Does the contractor monitor the quality of dense pack work as it is being performed?

If you cannot answer yes to any of these questions then most likely your contractor is not achieving a proper dense pack in the sidewalls.

Proper dense packing of sidewalls, will also improve the contractors' ability to reduce the blower door number. Dense packing the sidewalls, in conjunction with other air sealing measures, creates a good thermal boundary and the greatest benefit for the client.

So what else do we need to know?

- Besides the information described above, one will need to know the size of the bags being utilized by the contractor.
- On the Department Program Guidance webpage, under the "Assessment Calculators" section, there is a side-wall density calculator that will help quantify if successful dense pack was achieved.

There have been contractors reluctant to dense pack because of concerns about "blowing the walls off." This may be of concern if nails were used instead of drywall screws. However, there are techniques to minimize the risk of blowing out walls; such as:

- Use 1x4's to temporarily brace the sidewalls while the insulation is being installed
- Adjust the air and material feed for proper density
- Use a smaller sidewall tubing hose

A good initial assessment and multiple solutions to a problem are beneficial when deciding how to proceed.

Remember, whether using an energy audit or the Priority List, we should be striving for the best possible outcome that will have the greatest impact on reducing the client's utility consumption.

Considerable advancements in weatherization science and application techniques have occurred over the last 6 years. Home insulation and air-sealing is universally acknowledged as the best, lowest cost method of achieving energy savings and building efficiency. Payback, based on savings-to-investment ratio (SIR), for this measure stretches well past the objective.

<http://www.tdhca.state.tx.us/community-affairs/wap/guidance.htm>

Recommendation Summary: Ensure contractors have the correct equipment and know how to properly dense pack sidewalls. Final inspectors must know how to determine if contractor work is successful. Use an IR camera and drill inspection holes to verify insulation installation, and then use the Sidewall Density Calculator to mathematically verify dense-pack levels are achieved.