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RDH comments regarding proposed 2022 Whole Building Air Leakage Testing

Additional submitted attachment is included below.

The CASE team indicated during the *2022 Indoor Air Quality and Reduced Infiltration Workshop* held on 2020-11-03 that they have specific questions for stakeholders. Please see below for the questions as well as RDH's comment responses.

CASE Team Question #1:

Cost analysis is based on the infiltration rates listed below. How rigorous and realistic are these numbers?

- a. No continuous air barrier – 1.1 cfm/ft² @75 Pa
- b. Continuous air barrier only, not verified – 0.7 cfm/ft² @75 Pa
- c. Air barrier + field inspection – 0.5 cfm/ft² @75Pa
- d. Air barrier + testing – 0.4 cfm/ft² @75Pa

RDH Comment regarding Question #1:

The values given for all cases are on the high side but within the range of possibility. RDH projects which are reviewed and tested regularly achieve results of ~0.2 cfm/ft² at 75 Pa. Our experience is that the code air leakage assumptions noted in cases C and D are conservative and we would anticipate that buildings will achieve lower air leakage rates in reality. In general, our experience is that when project teams are given an air leakage testing requirement, the result is buildings that are significantly less leaky than when no air leakage testing is required. Even if the values assumed for all of the cases are on the higher side, the relative differences make sense for the purpose of calculating energy savings.

CASE Team Question #2:

Have issues with installation of air barriers in currently required climate zones been observed, and do these issues occur with sufficient frequency to justify the improvement in performance claimed to verification? (30% to 40% over non-verified)

RDH Comment regarding Question #2

The improvement in building airtightness as a result of required testing is well documented, and typically these studies refer to cold climates where airtightness was already a concern for durability reasons. (RDH airtightness study and associated ASHRAE Buildings paper) These studies suggest that the implementation of a testing requirement improves the overall airtightness of buildings on the order of 50%, and even further as building practices and trade familiarity continues to improve.

CASE Team Question #3:

Are there sufficient trained and qualified professionals in the state to assure a consistent level of verification performance and consistent results in all building types?

- a. What qualifications are needed for performing a visual inspection of an air barrier?
- b. What qualifications are needed for performing air barrier leakage testing?

RDH Comment Regarding Question #3:

Outside of California where similar requirements have been implemented, capacity has quickly grown to meet the demand with a combination of smaller scale energy advisors, test agencies (testing only), architects (design and review, not testing), and engineering consultants providing the required services depending the scale and complexity of the project. Qualifications include a familiarity with air barrier system products and associated detailing to be able to provide reviews. More general understanding of building enclosure design and construction is particularly beneficial for larger projects. To test small buildings, basic familiarity with the equipment and test protocols is required. This is relatively straightforward, and training is often available through manufacturers of test equipment or other organizations. For large building testing, the same skills apply, but the majority of the work is associated with coordination of the testing with the project team to ensure building preparation work is complete and that the testing can be conducted.