

Building Science Institute, Ltd. Co. Process 008-2023 Sampling

Approved by Brett Dillon – April 24, 2023, 8:45 a.m.

Related policies:

- [Building Science Institute, Ltd. Co. Policy 08-2022 Terminology](#)

This process applies to Verification Organization Verifiers and Software Analysts.

Referenced Documents:

[Building Science Institute Policy 08-2023 Terminology](#)

[Building Science Institute Process 009-2021 Root Cause Analysis](#)

Referenced Standards

ANSI/RESNET/ICC 301-2014, republished in 2016

ANSI/RESNET/ICC 301-2019

ANSI/RESNET/ICC 301-2022

ANSI/RESNET/ICC 380-2019

ANSI/RESNET/ACCA 310-2020

ANSI/ACCA Standard 12 QH-2018

Referenced Programs

EPA ENERGY STAR® Single Family New Construction

EPA ENERGY STAR Multi Family New Construction

EPA Indoor airPlus

DOE Zero Energy Ready Home Single Family

DOE Zero Energy Ready Home Multi Family

Terminology:

- *Multiple sampling plans* require a decision to accept or reject the members of a given sample set based on the results of the on-site observations and performance testing on a single random sample dwelling unit or multiple random sample dwelling units (if failing units are identified) within the sample set.
- The collection of all dwelling units under consideration is the *population*. The population must be within the same building (multifamily), have the same construction type, and have the same envelope systems.
- A *sample set* is a population subgroup whose performance will be represented by inspecting and testing as few as one member of that subgroup. The sample set must be no larger than 7 dwelling units having projected closing dates within a 30 calendar day period.
- Each dwelling unit in the population has an equal chance of inclusion in the sample, which creates a *random sample*, selected by the verification organization and NOT the homebuilder.
- The *expected values* are the threshold specifications from the Worst-Case Analysis for the minimum rated features for the dwelling units.

- On-site observation and performance testing in conformance with ENERGY STAR® Certification Protocols and referenced standards must be performed on a portion of the sample set to make a decision on the conformance of the entire sample set to the expected values. This is called *acceptance sampling by attribute*.

Sampling Process

Sampling is permitted only for multifamily dwelling units, and NOT allowed for single family homes (detached single family, duplexes, townhouses).

The verification organization must use a *multiple sampling plan*, if sampling is chosen. Energy simulation files for each dwelling unit must be based on Worst-Case Analysis using *expected values*.

If a verification organization fails to conform with the Building Science Institute Process 008-2023 Sampling protocols, that verification organization's eligibility to perform sampling must be revoked.

Before a sampling plan may be implemented, an initial group of 7 dwelling units must consecutively and successfully undergo 100% observation and performance testing without failure, in conformance with ENERGY STAR®, Indoor airPLUS, Zero Energy Ready Home Certification Protocols and referenced standards.

If there are any non-conforming items in a single *random sample* dwelling unit, the *sample set* may be rejected OR another 2 *random sample* dwelling units are selected from the remaining dwelling units in the *sample set* for on-site observations and performance testing in conformance with ENERGY STAR, Indoor airPLUS, Zero Energy Ready Home Certification Protocols and referenced standards. The non-conforming dwelling unit is rejected from the *sample set*, must be brought into conformance with ENERGY STAR, Indoor airPLUS, Zero Energy Ready Home Certification Protocols, and is ineligible for inclusion in future *sample sets*.

If there are any nonconforming items in these 2 dwelling units, the *sample set* must be rejected as non-conforming. Non-conforming dwelling units are rejected from the *sample set*, must be brought into conformance with ENERGY STAR®, Indoor airPLUS, Zero Energy Ready Home Certification Protocols, and are ineligible for inclusion in future *sample sets*.

When multiple nonconforming dwelling units are discovered, a root cause analysis per the [Building Science Institute Process 09-2021 Root Cause Analysis](#) must be performed by the verification organization's internal quality function or the Building Science Institute's True North Quality Management Services. The non-conforming element(s) must be corrected and re-verified for conformance prior to certification.

If two out of three consecutive *sample sets* have any nonconforming items, then sampling must be suspended, and that builder is no longer eligible to participate in sampling until the verification organization has conducted a root cause analysis in conformance with [Building Science Institute Process 09-2021 Root Cause Analysis](#).

Before a sampling plan may be re-implemented, another 7 consecutive dwelling units must successfully undergo 100% observation and performance testing in conformance with ENERGY STAR®, Indoor airPLUS, Zero Energy Ready Home Certification Protocols and referenced standards.

Nonconforming dwelling units must undergo 100% on-site observations and performance testing. Nonconforming dwelling units are units that do not meet all the *expected values* of the threshold specifications, and are ineligible for inclusion in future *sample sets*.

Approved by Building Science Institute Quality Council on April 24, 2023

Not Voting: Brett Dillon, Chair; Wes Davis

Approve: Amber Wood, Brian Christensen, Erik Straite, Kevin Burk

Reject: None

Copyright © 2023 by Building Science Institute, Ltd. Co.

This work is copyright protected and no portion may be reproduced, copied, duplicated, stored in a retrieval system, or transmitted by any means (electronic, mechanical, photocopying, recording or any other means) without the express written permission of the copyright holder.