

## **Built Green Colorado Random Energy Verification Requirements**

HERS Rating of 85 points or less when using the expanded HERS “INDEX” score based on the 2006 HERS Reference Home verified on a 5% random basis as required by the program’s random verification process.

Sampling must be overseen by a certified rater and must include:

- A from-plans rating from each plan type (defined below) considering worst-case orientation (site specific orientation may be used in custom applications), all known energy efficiency features (defined below), and specific climate zone(s)/site locations for each product type (defined below), and each applicable plan type within a product type.
- At least one site specific rating of each product type.
- IF after a from-plans rating is completed, changes are made to a plan type’s energy efficiency features (defined below), which changes reduce the energy efficiency of the home, then the changed plan type must receive:
  - A from-plans rating considering worst-case orientation, all known option packages, and specific climate zone(s)/site locations, *and*
  - At least one site specific rating of that changed plan type.

This requires that the 5% random site specific sampling required by the program must at a minimum include all product types a builder constructs, and in some cases must include similar product types if there are differences in or changes made to energy efficiency components or features or plan types within that product type.

### **Definitions:**

Energy Efficiency Features: Components of a home that can be defined independently of architectural characteristics, including but not limited to component insulation values and installation grades, equipment efficiencies, window U-values and Solar Heat Gain Coefficients (SHGC), assumed infiltration rates, mechanical ventilation system types and rates, assumed duct leakage and stated insulation values, thermostat types, and lighting and appliance efficiency levels.

Product Type: Product types are Residential Single Family, Townhome and Condominium as defined by the International Residential Building Code (IRC).

Plan Types/Elevations: A plan type is identified by the basic definition of a home’s physical configuration such as number of stories, foundation type, perimeter, conditioned floor area, window area and distribution, climate zone, wall and ceiling type. A single plan type may have multiple elevations. Different elevations will only be defined as a separate plan type if they differ in conditioned floor area by more than 150 SF, or window to wall area ratio changes by more than 1% of above grade wall area.

### **Examples:**

*Builder XYZ is constructing 80 homes per year. If all homes were of a single product and plan type with no differences in plan type elevations (defined above) and energy efficient*

features from home to home, the program's 5% random sampling requirement would require 1 from-plans rating and 4 site specific ratings.

However, Builder XYZ's 80 homes include 20 townhomes of the 900 series (product type), 20 townhomes of the 1000 series (product type), and 40 single family detached homes of the 6600 series (product type).

The 20 townhomes of the 900 series are constructed in 5 different townhome buildings with 3 different plan types, all with the same elevations (as defined above). All of the 900 series are constructed with the same energy efficiency features:

- All 3 plan types in the 900 series would require a from-plans rating to determine if the Built Green energy requirement is satisfied.
- At least one of the units in the 900 series would require a site specific HERS rating to determine if the rated features in the home results in a HERS Index score of  $\leq 85$  points.

The 20 townhomes of the 1000 series are constructed in 6 different townhome buildings with 4 different plan types. All of the 1000 series are constructed with the same energy efficiency features:

- All 4 plan types in the 1000 series would require a from-plans rating to determine if the Built Green energy requirement is satisfied.
- At least one of the units in the 1000 series would require a site specific HERS rating to determine if the rated features in the home results in a HERS Index score of  $\leq 85$  points.

In the 40 remaining 6600 series single-family homes there are 5 different plan types, with 2 different elevations per plan type. All of the 6600 series single family homes are constructed using the same energy efficiency features, however, of the 5 different plan types, one of the elevations adds a finished bedroom above the garage, adding an additional 250 SF :

- All 5 plan types **and** the elevation which has the added bedroom (see Plan Types/Elevations definition above) would require a from-plans rating to determine if the Built Green energy requirement is satisfied.
- At least 2 of the homes (5% of 40) would require a site specific HERS rating to determine if the rated features in the home results in a HERS Index score of  $\leq 85$  points.

Outcome: Builder XYZ would have to conduct a minimum of 13 from-plans ratings and 4 site specific ratings, as outlined above.

Example with an energy efficiency change to a plan type:

After the initial from-plans ratings of the 5 plan types in the series 6600 homes, Builder chooses to change the insulation levels in the second story walls from R-20 to R-13 and to change the furnace from 90% to 80% in 2 of the plan types:

- *In this instance the 2 revised plan types would need to have from-plans ratings done, verifying that the Built Green energy requirement is satisfied.*
- *At least 1 of the homes built in accordance with the changes would require a site specific HERS rating to determine if the rated features in the home results in a HERS Index score of  $\leq 85$  points.*

*If the Builder installed a higher level of insulation and a better furnace than that indicated in the original from plans no additional from plans ratings are needed on the remaining plan types and the 5% random verification will remain as scheduled. Improvements that result in an increased number Built Green Checklist points must be documented by the Builder and only those homes that are built with those improvements will receive the increased points.*