



BUILDER PRACTICES REPORT 2011

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**RADON-RESISTANT
CONSTRUCTION PRACTICES
IN NEW U.S. HOMES
2011**

Prepared for

U.S. Environmental Protection Agency
Indoor Environments Division
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Prepared by

NAHB Research Center, Inc.
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**Annual Builder and
Consumer Practices Surveys
October 2012**

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Mission Statement

The NAHB Research Center's mission is to promote innovation in housing technology to improve the quality, durability, affordability, and environmental performance of homes and home building products.

About the NAHB Research Center

Created in 1964 as a subsidiary of the National Association of Home Builders (NAHB), the NAHB Research Center has established itself as an important source for reliable, objective information and research on housing construction and development issues.

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INTRODUCTION

The NAHB Research Center's *Builder Practices Reports* provide a comprehensive look into new home characteristics and the products and materials purchased by home builders nationwide. The reports are based on data obtained through the *Annual Builder Practices Survey*, a nationally disseminated paper survey of home builders. The resulting data are tabulated using a robust methodology that includes balancing on geographic and demographic variables to provide an accurate picture of the characteristics of homes built each calendar year.

The *Builder Practices Reports* present data on materials purchased for single-family detached homes and Multifamily dwelling units. These data are shown as "coefficients," which are per-house averages, and "product usage," which is the total volume of homes with certain characteristics built in each geographic area.

Coefficients for single-family detached homes are calculated for 32 separate U.S. geographic areas, referred to as "State-Market-Areas", which are individual states, portions of states, or clusters of states with similar geography and climate. States with relatively low housing starts have been grouped with another state or states to create one State-Market-Area, while three states with a high level of new home construction activity (California, Florida, and Texas) are split into two State-Market-Areas. Where a state is split, the dividing line typically occurs along changes in climate, topography, or dominant construction practices, and always along county lines. This generally assures that geographic similarities, climatic characteristics, or architectural preferences are maintained within a distinct reporting area.

The data are reported by 32 State-Market-Area data for single-family detached dwellings, by 9 Census Divisions and national totals for both multifamily and single-family detached dwellings. Weights are assigned to each record, based on either housing starts or number of radon-resistant construction systems installed, to assure larger builders get proportionally greater weight than smaller builders. Further, totals for each 32 State-Market-Area receive weights that are proportional to their housing starts when calculating averages for each of the nine U.S. Census Divisions. U.S. averages are a weighted total of the nine Census Divisions. Data are also presented for the three Radon Exposure Zones established by the United States Environmental Protection Agency.

The Multifamily data, which include single-family attached dwellings (Apartments, Duplexes, Townhouses and Row Houses) are tabulated by the nine U.S. Census Divisions and by the three Radon Exposure Zones. National coefficients are weighted averages of coefficients at the Census Division, weighted by the proportion of multifamily starts they represent to total U.S. multifamily starts.

Historic and forecasted housing starts are provided by the National Association of Home Builders and are based on U.S. Census Bureau data.

Product Usage is the total estimated volume or amount of material used and is tabulated by the three Radon Exposure Zones and the U.S. as a whole. One set of tabulations presents data for both single-family and multifamily dwellings and another set of tabulations presents data for only single-family detached dwellings. These data are estimated using the coefficients described previously, along with the housing start data for each Radon Exposure Zone. Product usage data are calculated for each zone and summed to produce totals for the U.S. as a whole.

GEOGRAPHIC SAMPLING

The data are presented by geographic areas established by the U.S. Census Bureau in 1910, called Census Divisions. The Census Divisions include all 50 states, and the District of Columbia. The nine U.S. Census Divisions are shown in Figure 1 below.

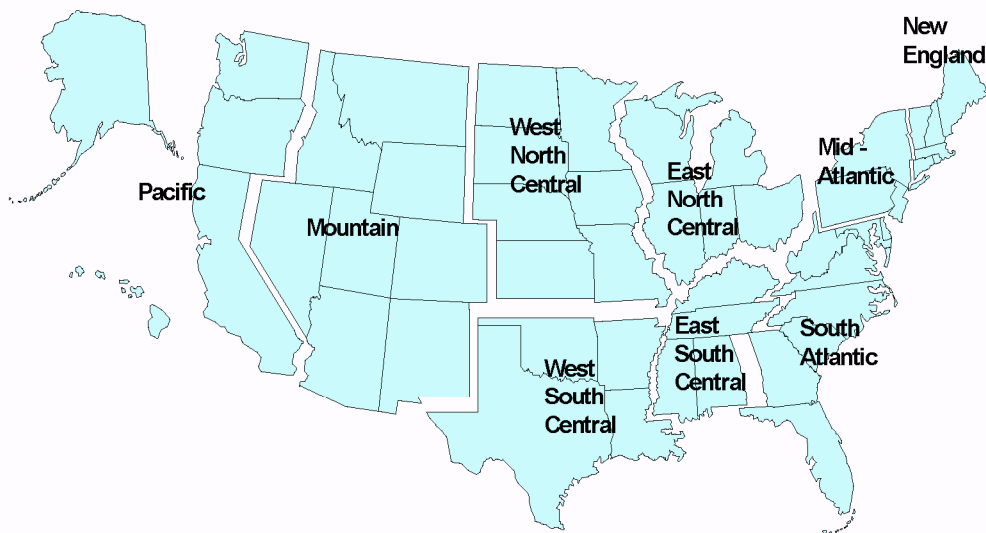


Figure 1: United States Census Division Map

The 32 State-Market-Areas established by the NAHB Research Center are listed below within their respective Census Divisions. Numbers in parenthesis show percentage of single-family detached housing starts for each State-Market-Area within its Census Division:

New England

- Connecticut, Massachusetts, and Rhode Island (63.2%)
- Maine, New Hampshire, and Vermont (36.8%)

Mid-Atlantic

- New Jersey (23.9%)
- New York (29.1%)
- Pennsylvania (47.0%)

South Atlantic

- Delaware, Maryland and District of Columbia (9.9%)
- Northern Florida (Tampa and north) (17.7%)
- Southern Florida (south of Tampa) (10.9%)
- Georgia (12.6%)
- North Carolina and South Carolina (33.5%)
- Virginia and West Virginia (15.5%)

East North Central

- Illinois (17.2%)
- Indiana (23.4%)
- Michigan (19.8%)
- Ohio (23.0%)
- Wisconsin (16.5%)

East South Central

- Alabama and Mississippi (44.1%)
- Kentucky and Tennessee (55.9%)

West North Central

- Iowa and Nebraska (31.6%)
- Kansas and Missouri (32.1%)
- Minnesota (21.7%)
- North Dakota and South Dakota (14.5%)

West South Central

- Arkansas and Oklahoma (12.1%)
- Louisiana and East Texas (Houston to Corpus Christi, and west to the semi-arid plains) (42.6%)
- West Texas (Dallas to San Antonio and west) (45.3%)

Mountain

- Arizona, Nevada, and New Mexico (46.7%)
- Colorado and Utah (38.6%)
- Idaho, Montana, and Wyoming (14.7%)

Pacific

- Northern California (counties north of Kern, San Luis Obispo, and San Bernardino) (24.2%)
- Southern California (Kern, San Luis Obispo, San Bernardino and south: the ten southern-most counties) and Hawaii (32.2%)
- Oregon (11.1%)
- Washington and Alaska (32.5%)

METHODOLOGY

In order to gather data for the material usage coefficients, the NAHB Research Center mailed the Annual Builder Practices Survey to nearly 29,500 active home building companies nationwide. The sample frame was generated randomly from a pool of NAHB members who indicated that new home construction was their primary occupation. Over 900 questionnaires were sent to companies in each of the 32 State-Market-Areas. Approximately 1,400 usable responses were received for the 2011 survey where 1,323 respondents reported building single-family detached homes and 160 reported building multifamily dwellings (Apartments, Duplexes, and Single-Family Attached - Townhouses and Row Houses). The survey design enabled individual builders to respond separately to questions about Single-Family Detached as well as multifamily dwellings. The number of responses, by geography, is illustrated in Table 1.

Counts by Census Division and 32 State-Market-Area					
New England	91	West North Central	179	West South Central	165
CT, MA, RI	60	IA, NE	43	AR, OK	47
ME, NH, VT	31	KS, MO	43	LA & East TX	44
		MN	52	West TX	74
		ND, SD	41		
Mid-Atlantic	131	East South Central	106	Mountain	95
NJ	32	AL, MS	49	AZ, NV, NM	28
NY	43	KY, TN	57	CO, UT	37
PA	56			ID, MT, WY	30
East North Central	207	South Atlantic	271	Pacific	142
IL	34	DE, MD, DC	41	North CA	25
IN	47	North FL	52	HI, South CA	27
MI	48	South FL	28	OR	37
OH	37	GA	44	WA, AK	53
WI	41	NC, SC	64		
		VA, WV	42		

Table 1: Builder Practices Survey Responses by Region

Since numerous U.S. home building companies have multiple offices throughout the country, each local building establishment of multi-regional and national firms is recognized as a separate entity. Hence, questionnaires were sent to local home building establishments, not to regional offices or national headquarters. To assure that local offices are reporting only on homes built by their own operations and not the homes constructed by operations in other areas, the programming methodology allows a maximum of 120 single-family detached homes built by a respondent's local operation and 250 single-family attached homes and multifamily dwellings.

To encourage participation, respondents were offered a selection of gift choices valued at about \$20. Discounting a percentage of surveys that were undeliverable, that reached non-builders or multiple persons within a single company, the overall response rate was six percent.

STATISTICAL ESTIMATES

The uncertainty in the estimates presented in this report generally decreases as the sample size increases. The underlying distribution of survey responses is either binomial or multinomial in nature, so the standard deviation of any proportion p estimated from the survey is:

$$\sigma_p = \sqrt{\frac{P \times (1-P)}{n}}$$

where: σ_p = the standard deviation of the estimated proportion,
 P = the true proportion, and
 n = the sample size (number of responses).

Based on a normal approximation to the binomial distribution, a symmetrical 95 percent confidence interval estimate of the true proportion P would be:

$$P = p \pm (1.96 \times \sigma_p)$$

While p for the sample is known, the true proportion P is unknown, so σ_p cannot be computed exactly. Still, a reasonable approximation can be made by using the observed proportion p to estimate σ_p . For example, a 95 percent confidence interval for P , for the inclusion of two car garages in single-family detached houses built in the United States, based on a sample size of $n = 1,323$ builders and an observed usage rate of $p = 0.540$ (or 54.0 percent), would be computed as follows:

$$\sigma_p = \sqrt{\frac{(0.540)(0.460)}{1,323}} = 0.0137$$

As a result, the 95 percent confidence interval is:

$$P = 0.540 \pm (1.96 \times 0.0137), \text{ or } 0.5131 \leq P \leq 0.5669$$

This calculation indicates that the true value of P is highly likely to be between 51.3 percent and 56.7 percent. If the true P had been outside this range, the probability of observing a value p as extreme as the value that was actually observed would be five percent or less (based on a 95 percent confidence interval). This approximation is satisfactory where $n \geq 25$ and p is not too close to 0 or 100 percent. Other methods can be used to compute confidence intervals where these conditions are not met.

Usage rates can be interpreted as proportions of a total, and confidence limits for the proportion multiplied by the total may be used to derive a confidence limit for the coefficient.

DETAILED DATA TABULATIONS

This report, *Radon-Resistant Construction Practices in New U.S. Homes*, includes eight appendices that contain general and detailed radon-related construction data calculated from builders' responses.

- Appendix A: contains data on the usage rates of radon-reducing features for single-family detached houses for each of the nine Census Divisions and the U.S. Total.
- Appendix B: contains data on the usage rates of radon-reducing features for multifamily (townhouses and apartments) housing units for each of the nine Census Divisions and the U.S. Total.
- Appendix C: contains data on the usage rates of radon-reducing features for single-family detached houses for the 32 State-Market-Areas.
- Appendix D: contains data on the usage rates of radon-reducing features for single-family detached houses for each of the three EPA Radon Exposure Zones and the U.S. Total.
- Appendix E: contains data on the usage rates of radon-reducing features for multifamily housing units (Apartments, Duplexes, and Single-family Attached - Townhouses and Row Houses) for each of the three EPA Radon Exposure Zones and the U.S. Total.
- Appendix F: contains product usage data for single-family detached houses for the three EPA Radon Exposure Zones and the United States as a whole.
- Appendix G: contains product usage data for all representative houses for the three EPA Radon Exposure Zones and the United States as a whole.
- Appendix H: contains a copy of the *2011 Annual Builder Practices Survey* questionnaire used to gather the information from home builders.

The data tables that accompany this report present the usage coefficients and product usage for radon-reducing features in new homes. The tabulations are for both single-family detached and multifamily housing. Multifamily data include townhouses and duplexes (both are called "single family attached" in this report), apartments, and condominiums.

REPORT DATA TABLES

Figure 2 provides an example of the general layout of each of the data tables of coefficients presented in Appendices A through E.

The first page of the material usage coefficient tables in Appendices A through C contains an overview of the radon-reducing features of new homes based on the results gathered from the 2011 survey. Near the top of Page 1 of each table (except Product Usage tables) is a section titled "Sample Size" (①) for that table which summarizes the house-building activity for the sample of respondents in the survey year who answered the radon-related questions, followed by the number of units in the sample (②) and the number of builders represented in the sample (③).

The lines that follow on Page 1 of the example show the distribution of homes built with and without radon-reducing features in one-story homes within each foundation type (④), and the coefficient for each (⑤). The data continues beyond this example to include two- and three-story houses, as well as a summary by foundation type and a total for all dwellings. The bottom row, or Total, is the sum of all coefficients in that category (⑥). In Appendices A and B, data are given for each of the nine Census Divisions. The example below shows the New England, Mid-Atlantic, and East North Central Census Divisions (⑦). The six additional Census Divisions are found further to the right on the same page. In Appendix C, data are given for each of the 32 State-Market-Areas and the nine Census Divisions. Appendices D and E provide the data for each of the three EPA Radon Exposure Zones for single-family detached houses and multifamily dwellings.

BUILDER PRACTICES REPORT Copyright 2012, NAHB Research Center, Inc.			
	⑦ NEW ENG	⑦ MID ATL	⑦ E N CEN
SAMPLE SIZE ①			
Units ②	186	354	871
Builders ③	81	121	199
WEIGHTED AVERAGE UNITS PER	2.3	2.9	4.4
TYPE OF HOUSE: WITH RADON-REDUCING FEATURES			
One Story Dwellings With Basements ④	⑤	⑤	⑤
With radon-reducing features	7.8%	6.1%	12.1%
No radon-reducing features	29.2%	29.0%	35.5%
One Story Dwellings With Crawl Spaces ④			
With radon-reducing features	0.0%	0.0%	3.9%
No radon-reducing features	0.4%	1.3%	3.7%
One Story Dwellings On Slabs ④			
With radon-reducing features	2.8%	0.3%	0.3%
No radon-reducing features	2.1%	1.8%	6.0%
Houses on piers ④	0.5%	0.6%	0.3%
TOTAL ⑥	⑥ 100.0%	⑥ 100.0%	⑥ 100.0%

Figure 2: Sample of the Radon Coefficient Tables

The subsequent pages of each set of data tables follow this format and present additional tabulations. Page 2, for example, shows tabulations for houses tested for radon by foundation type, radon-reducing features by construction method, and radon-reducing features by size of builder.

Page 3 continues by providing a breakout of the different methods employed to reduce radon in houses with basements, crawl spaces, and slabs and includes tabulations of sealing methods used in basements and slabs. Page 4 gives data on the methods used in the sub-slab preparation of basements and slabs and the sum of both foundation types. Finally, Page 5 shows results for the estimated costs for builders to include radon-reducing design features.

WEIGHTING PROCEDURES FOR TABULATIONS

In Appendices A through E, data for single-family detached homes are presented as averages of builder responses for each of the 32 State-Market-Areas with each response weighted by the number of homes constructed in 2011. Multifamily data are presented as weighted averages of each of the nine U.S. Census Divisions. When combined to create Census Division or U.S. totals, individual State-Market-Area and Census Division averages for single-family detached homes are weighted by the number of housing starts in each geographic area (except in Appendices D and E, see below). For example, Pennsylvania had 47.0 percent of all single-family detached (SFD) starts in the Mid-Atlantic States in 2011; and new SFD home starts in Mid-Atlantic were 6.0 percent of total U.S. SFD starts. Consequently, the Pennsylvania average has a weight of 2.8 percent when developing U.S. total averages ($47.0\% \times 6.0\% = 2.8\%$).

In Appendices D and E, the coefficients by Radon Zone for single-family detached and multifamily homes, the data are presented as weighted averages of the responses from each of the three Radon Zones. These are weighted by the number of homes constructed per respondent but are not weighted by the number of starts in each geographic area within a Radon Zone. Therefore, weighting the zones tabulations by housing starts to achieve the U.S. totals would produce results different from the U.S. totals reported here.

DEMOGRAPHIC SAMPLING

The complete *Annual Builder Practices Survey* respondent database for 2011 includes 1,323 builders who constructed 9,051 SFD homes, and 160 builders of 4,443 multifamily units. Builders in the sample ranged from those who constructed a single home in 2011 to national companies whose combined regional and local offices built thousands of homes in 2011.

The distribution of **all Single-family Detached** homes built by survey respondents, in each Census Division, measured by housing units, is compared to national housing start activity in 2011, and is shown in Table 2. **Any differences between the survey sample and actual starts are corrected by the weighting procedure explained previously.**

Census Division	Percent of 2011 Sample	Percent of 2011 Starts
New England	2.7%	2.7%
Mid-Atlantic	5.1%	6.0%
East North Central	13.4%	9.8%
West North Central	10.9%	7.5%
South Atlantic	21.5%	26.5%
East South Central	9.6%	7.0%
West South Central	20.7%	20.5%
Mountain	5.8%	9.5%
Pacific	10.3%	10.5%
United States Total	100.0%	100.0%

Table 2: Annual Builder Practices Survey Distribution of All Responses by Census Division

BUILDERS AND THEIR HOMES

AVERAGE UNITS PER BUILDER IN 2011

In 2011, the average number of homes constructed by single-family detached (SFD) builders in the *entire survey sample* was 6.8. In 2010 and 2009, the averages were 6.9 and 8.5 homes per respondent.

The average single-family attached/multifamily builder in the sample constructed 27.8 units. In 2010 and 2009, the averages were 28.9 and 24.1 units per respondent.

PRICE DISTRIBUTION OF SINGLE-FAMILY DETACHED HOMES IN 2011

The *Builder Practices Survey* routinely gathers information on the average square footage and sales price of starter, move-up, and luxury homes built in the survey year. Figure 3 shows the percentage distribution of all single-family detached homes built along these price-points (i.e., starter, move-up, and luxury) for 2011, 2010, and 2009.

Figure 3 shows the distribution by starter, move-up, and luxury home categories, for the past three years.

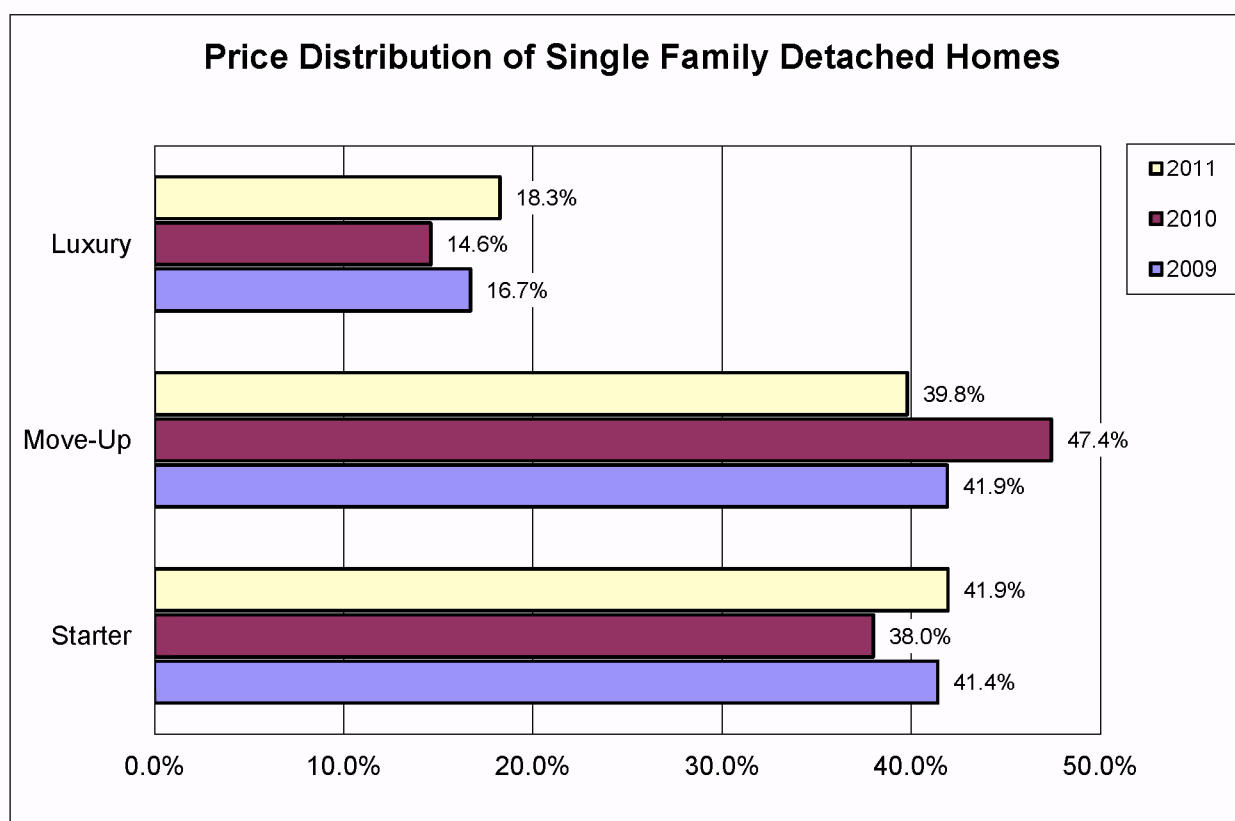


Figure 3: Distribution of New Single-family Detached Homes by Price-Point, 2009 to 2011

CHARACTERISTICS OF NEW SINGLE-FAMILY DETACHED HOMES

AVERAGE SIZE OF NEW HOMES

Results from the Annual Builder Practices Survey show that the average size of new single-family detached homes in the sample for 2011 was 2,443 square feet, up from 2010 (2,249 square feet) and 2009 (2,235 square feet).

Figure 4 shows the results by starter, move-up, and luxury home categories, for the past three years.

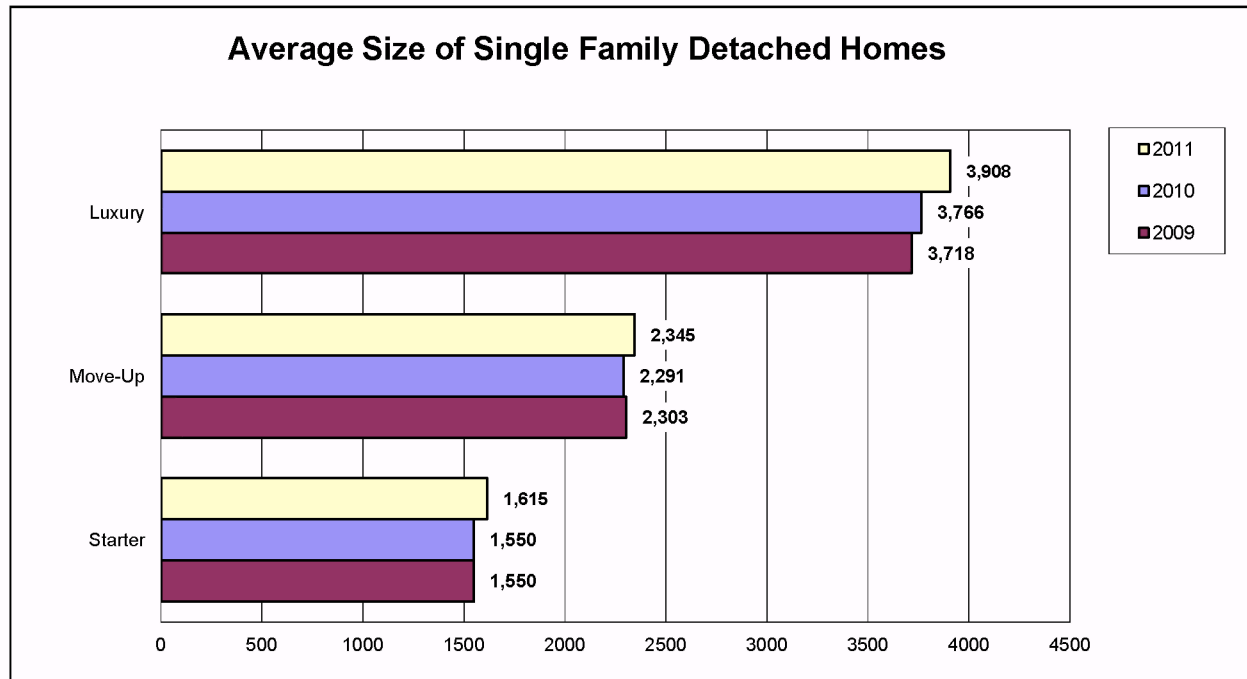


Figure 4: Average Size of Single-family Detached Homes by Price-Point, 2009 to 2011

AVERAGE PRICE OF NEW HOMES

In 2011, a new single-family detached home (including land) averaged \$348,516. In 2010 the average price of a new single-family detached home was \$323,061, and in 2009 it was \$301,607.

Figure 5 gives average prices for starter, move-up, and luxury homes, for the past three years.

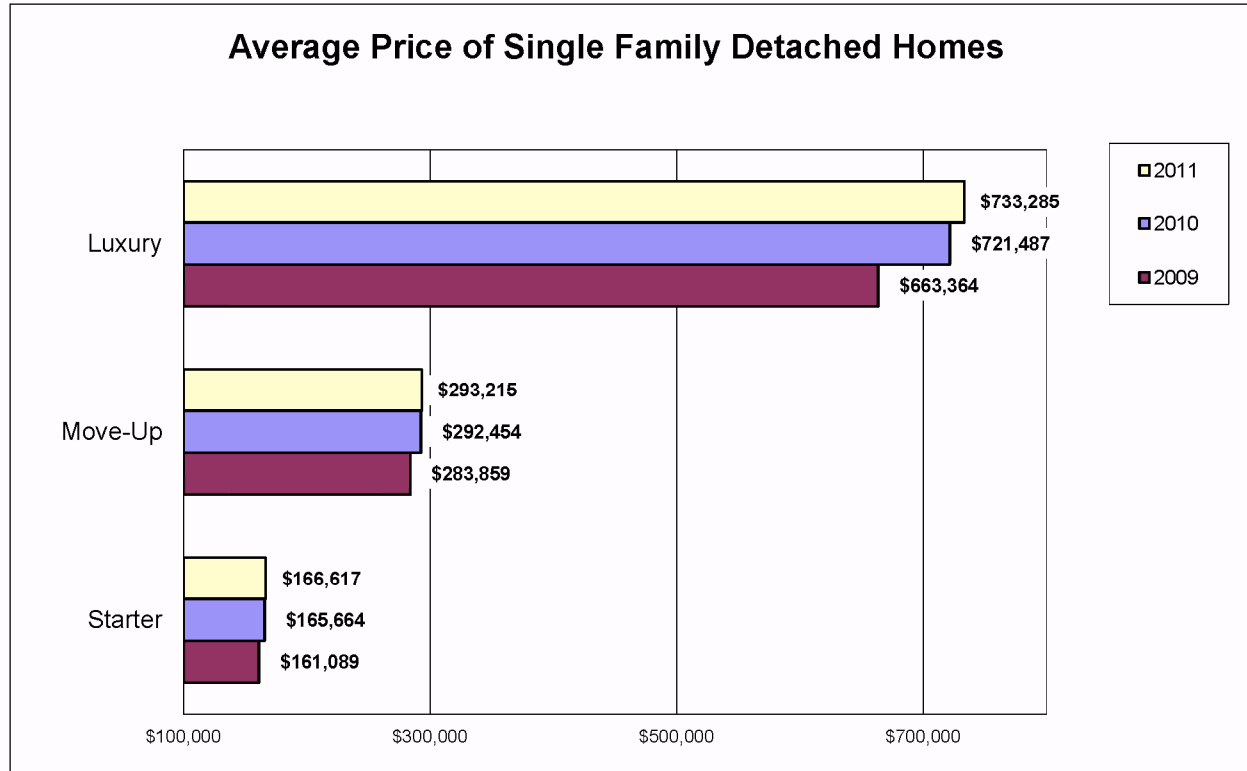


Figure 5: Average Price of Single-family Detached Homes by Price-Point, 2009 to 2011

RESIDENTIAL STRUCTURE TYPES

Just as in previous reports regarding radon-reducing features in new construction and all *Builder Practices Reports*, “single-family detached” is defined as a single dwelling unit that does not share any common walls or foundation with another dwelling unit.

“Single-family attached” are generally defined as sharing one or more common walls, with each unit resting on a separate foundation. “Multifamily” dwellings, on the other hand, are defined as sharing a common foundation with another unit. Typically, both single-family attached and multifamily units require two-hour fire-rated walls between buildings. However, multifamily units generally have one-hour fire rated floors and walls between units in some buildings.

This study uses the term multifamily housing to refer to all structures that contain more than one dwelling unit. It also combines into one category the market segment that was, prior to 1994, differentiated into single-family attached and multifamily low-rise units. This was done in order to assure a sufficient number of responses for reliable estimates.

HOUSING DESIGNS

SINGLE-FAMILY DETACHED HOUSING DESIGNS

Single-family detached housing tabulations are disaggregated into one-, two-, and three-story houses. In 2011, the share of one story homes continued to represent more than half of all new homes.

Figure 6 shows the national levels of all of these single-family detached housing designs, for the past three years.

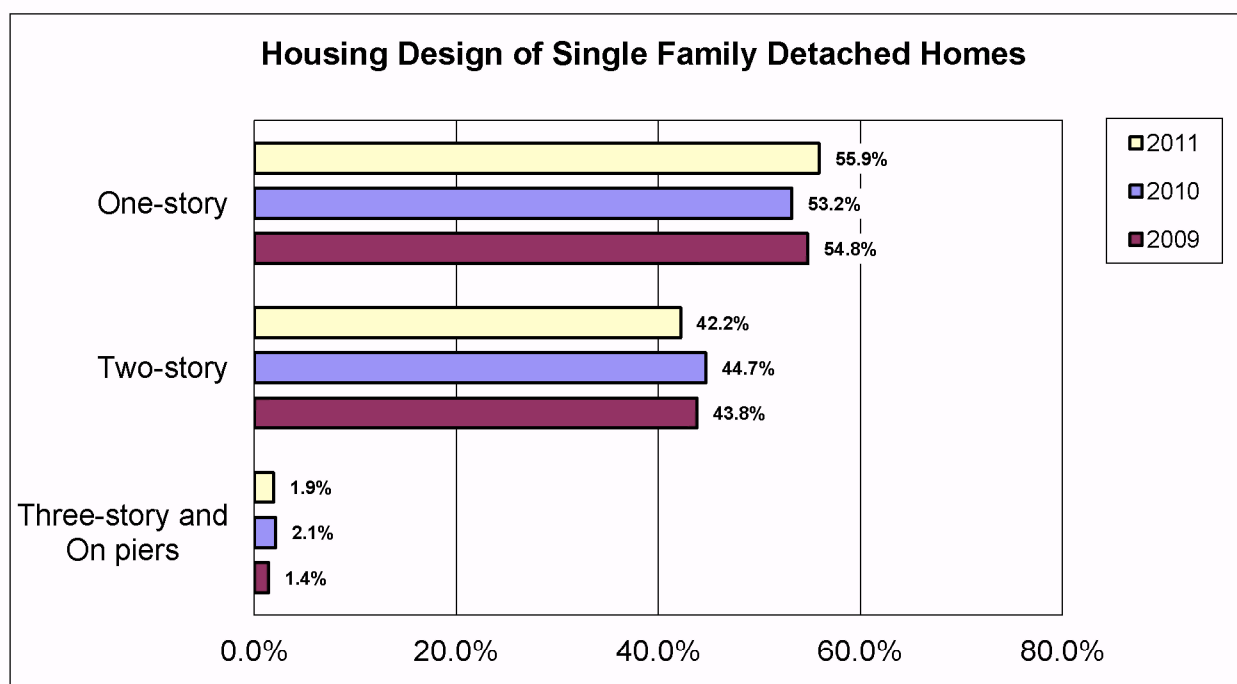


Figure 6: Design of Single-family Detached Homes Built from 2009 to 2011

MULTIFAMILY HOUSING DESIGNS

In this study, a multifamily unit is defined as a townhouse, duplex, or apartment and is generally less costly to construct than a single-family detached house by sharing foundations and roof structures. They further conserve building materials with adjoining walls between units and are typically built at higher densities to conserve land cost. The average multifamily unit is smaller than a single-family detached house. In 2011, the average multifamily dwelling had 1,360 square feet of finished space with an average selling price of \$204,424 (including land).

Due to the relationship between radon level and proximity of the living unit (apartment) to the ground, the data are presented separately by percentage of living units located on the first, second, and third floors. To calculate the number of living units on the first, second, and third floors, the assumption is made that half of the units of a two-story multifamily building are on the first floor, and half the units are on the second floor. In a three-story multifamily building, one-third of the units is credited to being on each of the first, second, and third floors.

Townhouses, which are also known as single-family attached houses, are included in the multifamily count. They are also tabulated according to the number of stories they have. In 2011, one-story townhouses accounted for 34.1 percent, two-story townhouses for 43.5 percent, three-story townhouses for 22.3 percent.

FOUNDATION TYPES

Foundation types in the radon samples are shown in Figure 7 below for 2011, 2010, and 2009. The incidence of pier foundations is reported in the data tables, but they are excluded from the analysis of radon-venting practices.

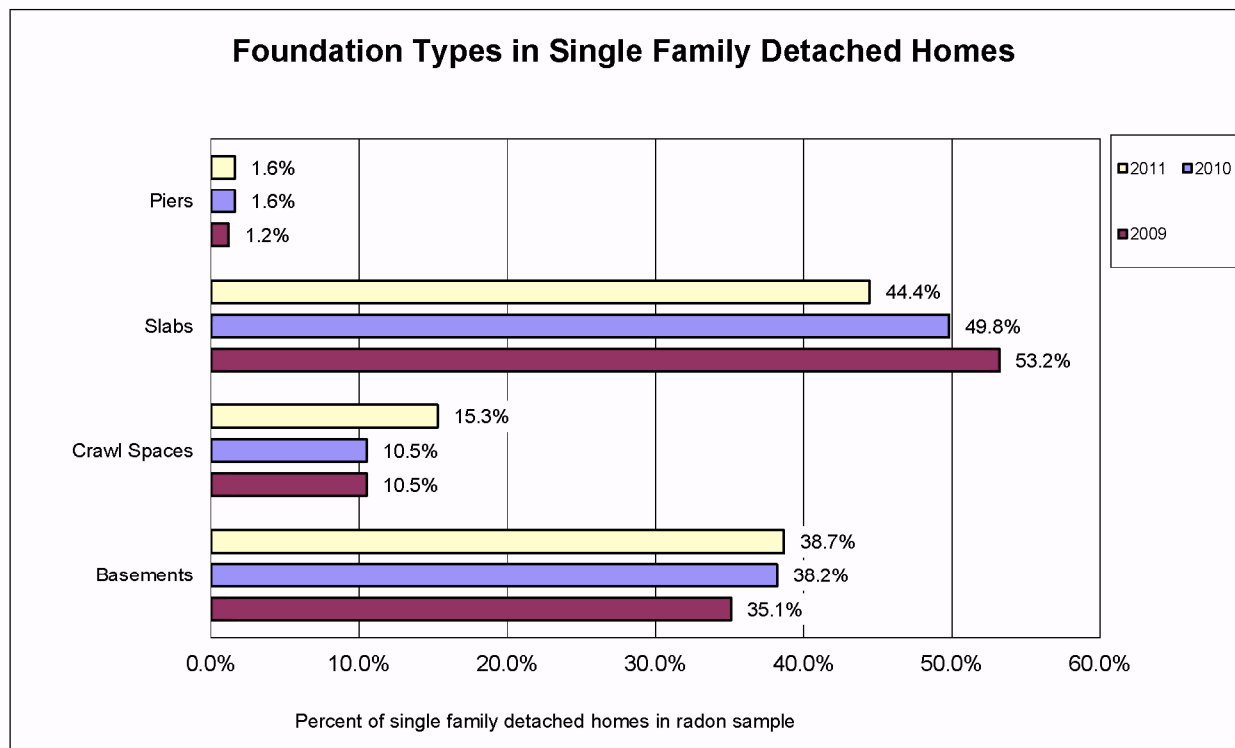


Figure 7: Foundation Types in Single-family Detached Homes Built from 2009 to 2011

The Builder Practices Survey questionnaire asks if a house has a split foundation -- partially basement and partially slab or crawlspace. If a house has a partial basement, it is included in the basement count. This considered, 51.9 percent of single-family detached dwellings with basements built in 2011 were two- or three-story homes. This may be considered important because bedrooms are generally located on the upper floor(s) of a house and therefore furthest from the basement.

Among the EPA Radon Zones, Zone 1 has the greatest likelihood of radon occurrence. In 2011 about 26.0 percent of all new U.S. single-family detached homes were built in Zone 1, 29.5 percent in Zone 2, and 44.5 percent in Zone 3. The breakdown by foundation types shows that 78.2 percent of single-family detached homes built in 2011 in Zone 1 had basements. This is compared to 79.7 percent in 2010 and 75.9 percent in 2009. In contrast, only 9.6 percent of single-family detached homes built in Zone 3 had basements compared to 6.1 percent in 2010 and 9.5 percent in 2009.

Of all single-family detached homes built in Zone 1 in 2011, 8.5 percent had concrete slab foundations. In comparison, slab foundations accounted for 10.6 percent in 2010 and 13.0 percent in 2009. In Zone 3, 74.6 percent of all single-family detached homes built in 2011 had concrete slab foundations compared to 84.9 percent in 2010 and 80.0 percent in 2009.

OVERVIEW OF THE RESULTS

This report includes detailed tabulations of the use of various radon-reducing methods in new home construction, the preparation of the sub-slab in basements and slabs, and the sealing methods in basements, crawl spaces, and slabs.

In 2011, 16.6 percent of all new single-family detached homes, excluding those on piers, included a radon-reduction system. In 2010, this number was 16.8 percent, and was 13.7 percent in 2009. Installation of radon-reducing features in multifamily buildings in 2011 was 19.4 percent, up from 15.3 percent in 2010 and even 10.7 percent in 2009. This continues the long-term trend of flat to upward movement in radon-reducing feature installation in new residential construction.

SIZE OF BUILDERS

Single-family detached home builders were classified into four groups according to the number of units they built in a single year. Figure 8 shows the sample composition according to the percent of single-family detached houses built for the years 2009, 2010, and 2011.

Overall, the average size of builder, measured by annual housing starts, has declined somewhat over the past year.

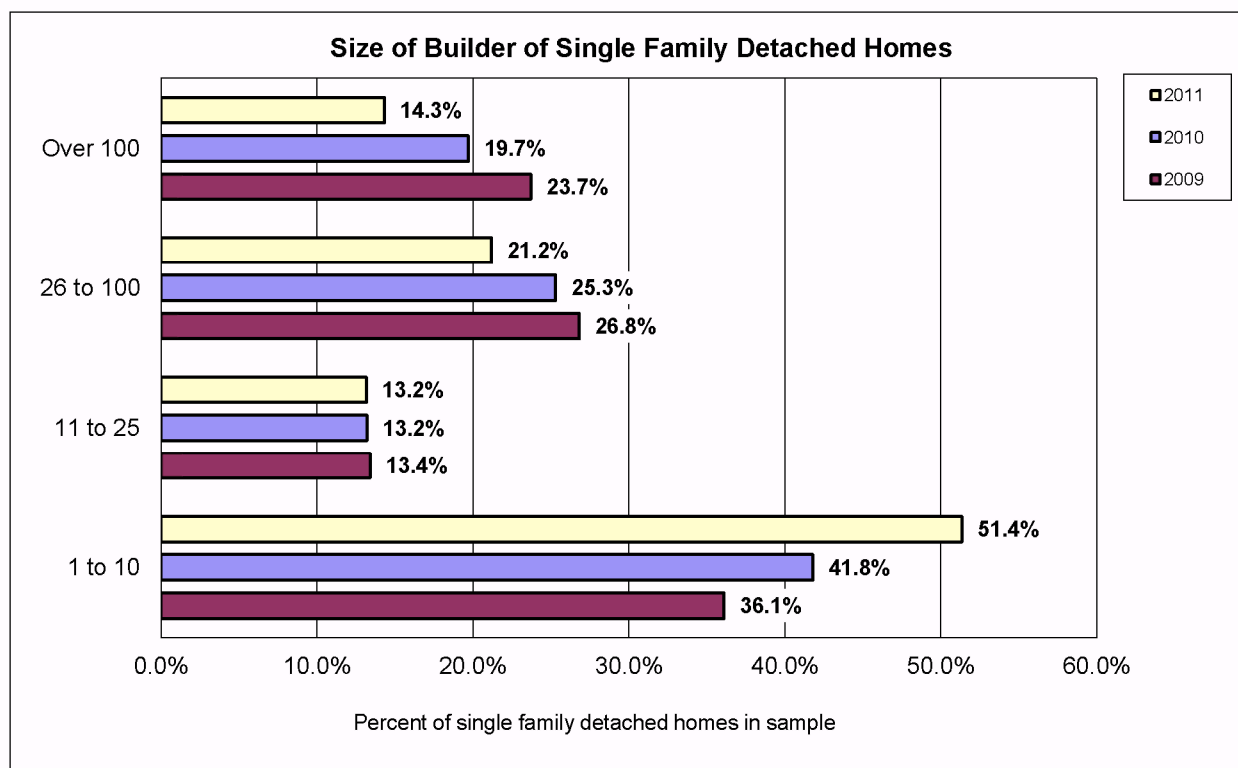


Figure 8: Composition of Radon Sample by Homes per Builder per Year, 2009 to 2011

Zone 1: Percent of Builders in Sample by Size of Builder: The table below shows the composition of the sample for single-family detached dwellings constructed in Zone 1 by size of builder.

	1 to 10	11 to 25	26 to 100	Over 100
2011	55.5%	20.2%	15.6%	8.7%
2010	53.5%	15.3%	20.3%	11.0%
2009	44.1%	11.8%	21.4%	22.7%

Table 3: Composition of Zone 1 Sample by Size of Builder

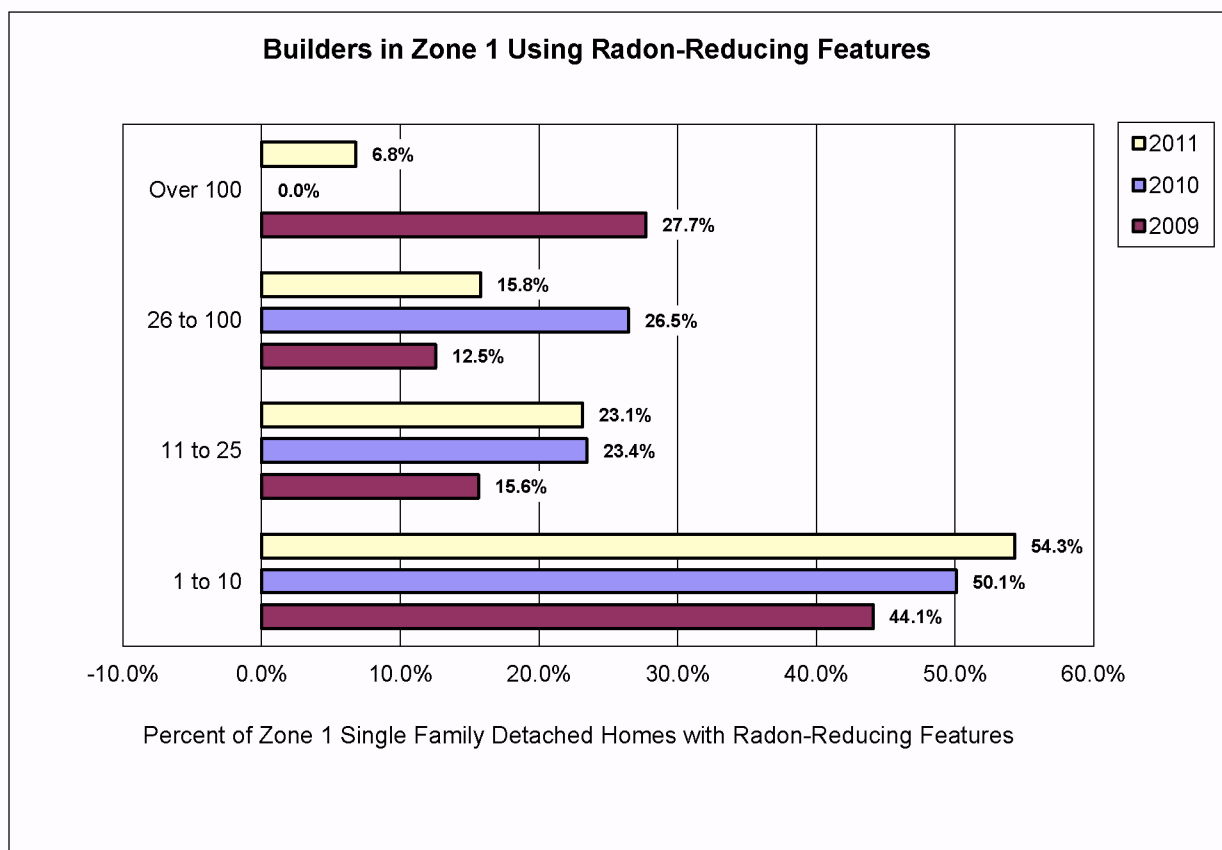


Figure 9: Composition of Zone 1 Single-family Detached Houses with Radon-Reducing Features

Zone 1: Percent of Builders Using Radon-Reducing Features, by Size of Builder: Figure 9 shows the distribution of single-family detached dwellings built with radon-reducing features in Zone 1 by builders in each size category.

RADON-REDUCING FEATURES IN SINGLE-FAMILY DETACHED HOUSING

A permeable layer under a basement or an on-grade slab can be vented to reduce the entry of radon gas into the home. The majority of new U.S. homes has at least four inches of gravel or crushed stone as a base for their concrete floors. However, to qualify as having radon-reducing features, a house must have either a passive stack ventilation pipe or an active system (fan-driven). Starting in 2004, “rough-in for future installation of a ventilation stack” no longer qualifies in this report as a radon-reducing feature. The rough-in itself does not reduce the level of radon, but it does allow for low-cost venting of the sub-slab cavity in the event that post-construction testing finds high levels of radon in the completed home.

In 2011, this study showed that 16.6 percent of new single-family homes had radon-reducing features, down slightly from 16.8 percent in 2010. Passive stack depressurization systems in U.S. single-family detached homes in 2011 had a reported usage rate of 13.9 percent. This is an down from reported usage rates in 2010 of 15.3 percent and 11.1 percent in 2009. Fan-driven sub-slab depressurization or ventilation of single-family detached homes built in 2011 was 2.7 percent, up from rates of 1.5 percent in 2010 and 2.6 percent reported in 2009.

While not included in the total share of homes with radon-reducing features, roughed-in systems were found in 8.1 percent of the single-family detached houses in the 2011 radon sample of homes with a basement or slab, up from 5.3 percent in 2010.

Radon-reducing features continue to be more prevalent in single-family detached homes with basements than with any other type of foundation. In 2011, 30.5 percent of single-family homes with basements were reported to have radon-reducing features, compared to 13.1 percent of homes built on crawlspace foundations and 5.9 percent built on concrete slab foundations. Further, 25.2 percent of single-family detached homes with basements reported having passive stack sub-slab ventilation installed; fan-driven sub-slab depressurization was installed in 5.3 percent of homes with basements. In single-family detached homes built on concrete slab foundations, passive and active systems were installed at rates of 5.3 percent and 0.5 percent, respectively.

Rough-ins for sub-slab ventilation were installed in 19.9 percent of single-family detached homes with basements and in 0.8 percent of single-family detached homes built on slabs in 2011.

Figure 10 shows the incidence of radon-reducing features across the nine Census Divisions for all single-family detached houses (excluding pier foundations).

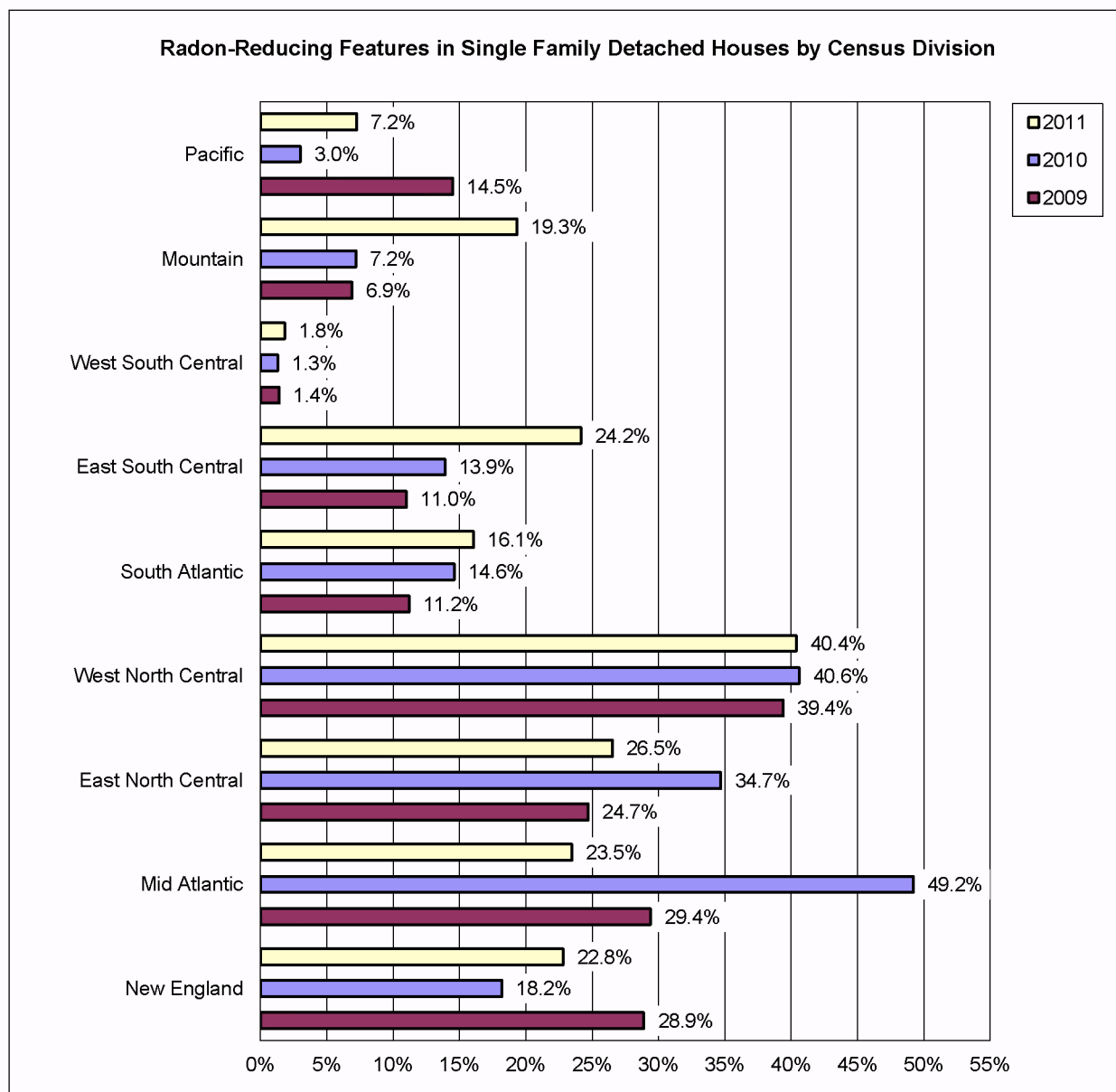


Figure 10: Radon-Reducing Features in Single-family Detached Houses by Census Division

A very important consideration is the distribution of radon-reducing features within the three EPA Radon Exposure Zones¹, with much higher inclusion rates of radon-reducing measures in zones with greater radon exposure. In 2011, shares of new single-family homes (excluding those on pier foundations) with radon-resistant features in Zones 1, 2 and 3 were 38.2, 21.8, and 3.9 percent, respectively. This correlates well with 2010 survey results, where shares of single-family detached homes with radon-reducing features in Zones 1, 2 and 3 were 40.1, 17.9, and 2.1 percent, respectively.

¹ Zone assignment is based on the county where builder constructed most of their homes.

RADON-REDUCING FEATURES IN MULTIFAMILY HOUSING

The overall incidence of radon-reducing features in multifamily living units and townhouses without pier foundations was 19.4 percent in 2011 compared to 15.3 percent in 2010. Like single-family homes, multifamily homes in zones with higher likelihood of exposure were more likely to have radon-resistant features. In 2011 the share of units in Zone 1 with radon-resistant features was 29.5 percent; in Zone 2, the rate was 18.2 percent; and, in Zone 3, the rate was 5.0 percent which is up from 2010, where the share of units in Zones 1, 2 and 3 were 18.9, 16.0, and 1.9 percent, respectively, with an increase in every zone.

SUBSLAB PREPARATION IN SINGLE-FAMILY DETACHED HOMES

Reducing radon levels in a house generally requires providing a permeable layer under the basement or first floor slab that can be vented or depressurized in order to remove the radon gas that originates in the surrounding soil. A vent exhausts the radon gas into the outside air so that it will not be drawn into the basement or finished living area. For basement and slab foundations, the layer is typically created by spreading four inches or more of gravel or crushed stone before the foundation is poured. Four inches of gravel or stone base is standard construction practice for drainage purposes in many areas of the country, making the incremental cost of a full radon-resistant system significantly lower.

For single-family detached homes in the United States in 2011, four inches or more of aggregate was used in 56.3 percent of the single-family detached homes with basements or slabs. This compares to 52.6 percent in 2010 and 46.1 percent in 2009.

The use of crushed aggregate increases as the risk of radon exposure rises. In Zone 1, the usage rate of four inches or more of aggregate under basements and slabs for single-family detached homes was 82.0 percent, compared to 70.3 percent in Zone 2 and 25.7 percent in Zone 3. This relationship held true for the years 2010 and 2009 as well.

SEALING METHODS IN SINGLE-FAMILY DETACHED HOMES

While polyethylene and other membranes placed directly beneath a concrete slab-on-grade floor are useful in radon-reduction, they are primarily used as vapor barriers to keep moisture from wicking from the ground, through the concrete floor, and into the home. In both basement and slab foundation dwellings, the placement of a membrane on top of the ground surface or aggregate before the slab is poured is the most frequently employed sealing method. The membrane is most commonly a 6-mil polyethylene sheet. Not only does the membrane provide a seal for the ground floor, it keeps the concrete from seeping into the crushed aggregate during the pour so that the crushed rock produces an effective air cavity.

Nationally, the percent of single-family detached homes **with basements** that used a polyethylene or other membranes under the concrete slab floor specifically for the purpose of sealing the slab against radon increased to 57.0 percent in 2011, up from 52.8 percent in 2010 and also up from 35.6 percent in 2009.

In single-family detached homes **with slabs**, 44.7 percent used a polyethylene or other membrane under the concrete slab to seal the slab against radon. In 2010, 42.7 percent used this method and 35.7 percent used this method in 2009. An interesting note here is that builders reported using a plastic or other vapor barrier that was not necessarily related to radon gas reduction in 66.3 percent of the sample. This compares to 70.9 percent and 54.1 percent in 2010 and 2009 respectively.

Less common, but used in conjunction with a vapor barrier membrane, is caulking around the slab edges, wall and floor openings, and joints. As concrete ages, it contracts slightly, so joints that were originally flush may form small gaps. Because most of this shrinkage occurs during the first several weeks, caulking a foundation toward the end of a home's construction cycle will more properly seal any gaps that develop.

In 2011, 16.5 percent of the single-family detached houses with basements were sealed with caulking. This is compared to 13.4 percent in 2010 and 8.3 percent in 2009. These results indicate a continued rise after what seemed to be a period of declining popularity for this practice.

In houses on slabs, 15.9 percent of the single-family detached houses on slabs used caulking as a sealing method. This is up from the 7.9 percent reported in 2010 and 4.9 percent reported in 2009.

The use of polyethylene membranes under the slab does not correlate as strongly with radon exposure zones as does the presence of fully operable systems. In the 2011 sample, 59.4 percent of single-family detached homes with basements in Zone 1 were sealed with polyethylene or another membrane under the basement, as were 48.5 percent in Zone 2, and 56.7 percent in Zone 3.

In 2011, among single-family detached houses with slabs, membranes were used in 71.6 percent of homes Zone 1, 45.9 percent in Zone 2, and 41.1 percent in Zone 3. This compares to the sample in 2010 where 47.3 percent in Zone 1, 45.9 percent in Zone 2, and 31.4 percent in Zone 3 used a membrane under slab as a sealing method. These values continue to be an indicator that these sealing techniques are used primarily for benefits not related to radon-reduction.

COSTS OF INSTALLING PASSIVE OR ACTIVE SUB SLAB OR SUB-MEMBRANE VENTILATION

The cost of installing radon-reducing systems in single-family detached homes has been noted as a barrier to their increased usage. In 2011, the average installation cost for a passive system in a single-family detached home was approximately \$296. This cost has remained about the same over the past several years, comparing to \$297 in 2010, \$290 in 2009, and \$295 in 2008.

The average cost of an active radon-reduction system in new SFD homes in 2011 was \$707, which represents an increase in the cost of fan-driven systems which was \$662 in 2010 and \$618 in 2009.

APPENDICES

APPENDIX A

SINGLE-FAMILY DETACHED USAGE COEFFICIENT TABLES

BY THE NINE CENSUS DIVISIONS

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
SAMPLE SIZE										
Units	186	354	871	753	1294	581	1332	236	487	6092
Builders	81	121	199	171	261	98	158	92	135	1316
WGHTD AVERAGE UNITS PER BLDR	2.3	2.9	4.4	4.7	4.7	5.9	8.8	2.7	3.9	5.2
TYPE OF HOUSE: WITH RADON REDUCING FEATURES										
One Story Dwellings With Basements										
With radon reducing features	7.8%	6.1%	12.1%	23.8%	1.0%	5.5%	0.0%	4.9%	1.5%	4.8%
No radon reducing features	29.2%	29.0%	35.5%	40.4%	8.1%	5.6%	2.9%	12.1%	4.2%	13.8%
One story Dwellings With Crawl Spaces										
With radon reducing features	0.0%	0.0%	3.9%	0.0%	0.7%	1.6%	0.0%	1.8%	1.6%	1.0%
No radon reducing features	0.4%	1.3%	3.7%	3.0%	8.5%	25.0%	0.9%	7.3%	13.3%	6.9%
One Story Dwellings On Slabs										
With radon reducing features	2.8%	0.3%	0.3%	0.9%	2.2%	4.2%	1.1%	5.7%	1.1%	2.0%
No radon reducing features	2.1%	1.8%	6.0%	1.5%	25.6%	25.3%	58.0%	23.2%	29.0%	26.6%
Two Story Dwellings With Basements										
With radon reducing features	11.3%	16.9%	9.3%	14.4%	9.5%	6.0%	0.1%	1.5%	1.4%	6.6%
No radon reducing features	42.3%	37.5%	24.4%	13.8%	11.4%	3.5%	0.7%	14.0%	7.7%	12.4%
Two Story Dwellings With Crawl Spaces										
With radon reducing features	0.0%	0.0%	0.6%	0.0%	1.3%	3.1%	0.0%	2.6%	1.0%	1.0%
No radon reducing features	0.1%	2.1%	2.8%	0.3%	9.5%	7.8%	0.7%	8.7%	16.3%	6.2%
Two Story Dwellings On Slabs										
With radon reducing features	0.7%	0.1%	0.1%	0.8%	0.4%	3.5%	0.6%	0.6%	0.6%	0.7%
No radon reducing features	0.9%	3.5%	0.6%	0.2%	17.7%	7.8%	30.0%	13.5%	18.1%	14.9%
Three Story Dwellings With Basements										
With radon reducing features	0.0%	0.0%	0.1%	0.4%	0.7%	0.2%	0.0%	2.1%	0.0%	0.4%
No radon reducing features	1.9%	0.2%	0.3%	0.0%	1.2%	0.0%	0.0%	0.7%	2.2%	0.7%
Three Story Dwellings With Crawl Spaces										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.7%	0.0%	0.0%	0.2%	0.0%	0.0%	1.0%	0.1%	0.2%
Three Story Dwellings On Slabs										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	1.0%	0.3%	0.3%	0.3%
Houses on piers	0.5%	0.6%	0.3%	0.5%	1.6%	0.8%	4.0%	0.0%	1.7%	1.6%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS										
Basements										
With radon reducing features	19.2%	23.1%	21.5%	38.7%	11.3%	11.7%	0.1%	8.5%	2.9%	11.9%
No radon reducing features	73.7%	67.2%	60.3%	54.6%	20.8%	9.1%	3.7%	26.7%	14.2%	27.0%
Crawl Spaces										
With radon reducing features	0.0%	0.0%	4.6%	0.0%	2.0%	4.7%	0.0%	4.5%	2.7%	2.0%
No radon reducing features	0.4%	4.1%	6.5%	3.4%	18.4%	33.1%	1.7%	17.0%	29.8%	13.4%
Slabs on Grade										
With radon reducing features	3.6%	0.4%	0.5%	1.7%	2.7%	7.8%	1.7%	6.3%	1.7%	2.7%
No radon reducing features	3.0%	5.3%	6.6%	1.7%	44.8%	33.7%	92.8%	37.0%	48.7%	43.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS										
With radon reducing features	22.8%	23.5%	26.5%	40.4%	16.1%	24.2%	1.8%	19.3%	7.2%	16.6%
No radon reducing features	77.2%	76.5%	73.5%	59.6%	83.9%	75.8%	98.2%	80.7%	92.8%	83.4%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
TESTING OF DWELLINGS										
All Units										
Tested For Radon Levels	40.7%	24.9%	21.5%	25.0%	7.7%	3.7%	2.6%	17.4%	4.4%	11.5%
Tested Units Needing More Work	12.9%	16.0%	26.2%	26.1%	9.3%	8.6%	0.0%	5.8%	0.0%	15.0%
Units With Basements										
Tested For Radon Levels	40.8%	24.2%	22.6%	25.5%	11.8%	6.8%	9.0%	17.6%	7.1%	20.1%
Tested Units Needing More Work	13.8%	18.3%	30.0%	27.5%	9.9%	10.0%	0.0%	6.7%	0.0%	20.0%
Units With Crawl Spaces										
Tested For Radon Levels	31.4%	72.7%	25.1%	10.4%	5.4%	3.7%	0.0%	42.5%	6.8%	12.8%
Tested Units Needing More Work	0.0%	0.0%	0.7%	0.5%	8.3%	11.5%	0.0%	5.5%	0.0%	4.3%
Units With Slabs										
Tested For Radon Levels	39.4%	3.4%	3.1%	27.8%	5.9%	2.1%	2.4%	4.9%	1.8%	3.8%
Tested Units Needing More Work	0.0%	5.0%	26.8%	1.2%	8.8%	1.4%	0.0%	4.6%	0.0%	4.8%
CONSTRUCTION METHOD										
DWELLINGS WITH RADON REDUCING FEATURES										
Conventional Constructed On Site										
With radon reducing features	22.8%	23.5%	26.5%	40.4%	16.1%	24.2%	1.8%	19.3%	7.2%	16.6%
No radon reducing features	77.2%	76.5%	73.5%	59.6%	83.9%	75.8%	98.2%	80.7%	92.8%	83.4%
Prefabricated Units (Panelized)										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Modular										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ALL Dwellings										
With radon reducing features	22.8%	23.5%	26.5%	40.4%	16.1%	24.2%	1.8%	19.3%	7.2%	16.6%
No radon reducing features	77.2%	76.5%	73.5%	59.6%	83.9%	75.8%	98.2%	80.7%	92.8%	83.4%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SIZE OF BUILDER										
DWELLINGS WITH RADON REDUCING FEATURES										
One to Ten Dwellings Per Year										
With radon reducing features	22.8%	23.1%	13.2%	22.5%	9.0%	6.5%	0.6%	12.3%	3.0%	9.4%
No radon reducing features	56.1%	53.2%	43.9%	38.4%	40.8%	31.3%	28.3%	57.7%	54.7%	41.9%
Eleven To Twenty-Five Dwellings Per Year										
With radon reducing features	0.0%	0.0%	10.4%	6.2%	1.4%	3.3%	0.0%	0.0%	0.0%	2.1%
No radon reducing features	8.8%	16.7%	6.8%	9.6%	15.5%	13.2%	11.7%	5.8%	4.4%	11.1%
Twenty-Six To 100 Dwellings Per Year										
With radon reducing features	0.0%	0.4%	2.3%	8.3%	3.2%	14.4%	1.2%	7.0%	0.0%	3.6%
No radon reducing features	12.2%	3.0%	17.1%	11.6%	14.1%	25.5%	23.7%	10.7%	29.6%	17.5%
Over 100 Dwellings Per Year										
With radon reducing features	0.0%	0.0%	0.6%	3.4%	2.5%	0.0%	0.0%	0.0%	4.3%	1.4%
No radon reducing features	0.0%	3.7%	5.7%	0.0%	13.5%	5.9%	34.5%	6.5%	4.0%	12.9%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
METHODS EMPLOYED TO REDUCE RADON										
Dwellings With Basements										
Rough-in for subslab ventilation	39.7%	24.2%	16.3%	20.3%	6.2%	1.5%	0.0%	2.4%	1.0%	7.7%
Passive stack subslab ventilation	13.2%	19.7%	17.1%	35.0%	10.0%	10.4%	0.1%	5.4%	0.5%	9.8%
Fan-driven subslab depressurization	6.0%	3.4%	4.3%	3.7%	1.3%	1.3%	0.0%	3.2%	2.3%	2.1%
Only sealed entry routes	5.3%	20.0%	20.4%	15.1%	8.5%	5.7%	3.3%	4.3%	8.6%	9.1%
None	28.7%	23.0%	23.6%	19.2%	6.1%	2.0%	0.3%	20.1%	4.6%	10.1%
SUBTOTAL -- BASEMENTS	93.0%	90.3%	81.8%	93.3%	32.1%	20.9%	3.8%	35.3%	17.1%	38.9%
Dwellings With Crawl Spaces										
Passive stack subslab ventilation	0.0%	0.0%	4.6%	0.0%	2.0%	4.6%	0.0%	1.6%	1.6%	1.6%
Fan-driven (active) ventilation	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	2.9%	1.1%	0.4%
Foundation Wall Vents	0.0%	0.7%	1.7%	0.0%	2.2%	10.3%	0.2%	1.7%	8.6%	2.6%
None	0.4%	3.4%	4.9%	3.4%	16.1%	22.7%	1.5%	15.3%	21.2%	10.8%
SUBTOTAL -- CRAWL SPACES	0.4%	4.1%	11.1%	3.4%	20.4%	37.7%	1.7%	21.4%	32.5%	15.4%
Dwellings With Slabs										
Rough-in for subslab ventilation	0.0%	0.0%	0.5%	0.4%	0.5%	0.4%	0.1%	0.4%	1.0%	0.4%
Passive stack subslab ventilation	2.3%	0.4%	0.4%	1.7%	2.5%	7.8%	1.7%	6.3%	0.5%	2.4%
Fan-driven subslab depressurization	1.3%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.1%	1.2%	0.2%
Only sealed entry routes	0.0%	1.7%	3.4%	1.0%	27.1%	23.5%	43.8%	7.3%	18.1%	20.9%
None	3.0%	3.6%	2.8%	0.3%	17.2%	9.8%	48.9%	29.3%	29.6%	21.8%
SUBTOTAL -- SLABS	6.6%	5.7%	7.1%	3.3%	47.5%	41.4%	94.5%	43.3%	50.4%	45.7%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS (Multiple Answers Possible)										
Dwellings With Basements										
Polyethylene/other membrn under slab	25.8%	58.9%	51.9%	57.5%	50.9%	85.6%	79.5%	27.1%	48.0%	57.0%
Membrane on frndtn. walls	9.4%	8.4%	12.6%	18.1%	3.3%	13.2%	8.0%	5.5%	12.9%	8.7%
Caulk around slab, wall opngs. & joints	13.2%	18.7%	25.3%	20.4%	14.3%	37.6%	7.4%	13.2%	17.1%	16.5%
Seal interior of foundation walls	6.7%	3.8%	11.5%	11.4%	12.5%	3.0%	0.7%	8.1%	9.4%	7.8%
Locate sump access outside of bsmt.	1.0%	2.2%	1.1%	0.6%	1.4%	0.0%	0.7%	0.0%	0.0%	0.8%
Install air tight sump pit covers	7.8%	20.2%	27.4%	25.8%	10.2%	32.8%	0.7%	4.8%	0.0%	11.6%
Other	3.5%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
None	58.8%	36.5%	36.5%	31.2%	40.3%	14.4%	9.3%	63.5%	45.8%	34.1%
TOTAL (may exceed 100%)	126.4%	148.8%	166.4%	165.2%	132.9%	186.5%	106.3%	122.1%	133.2%	136.7%
SEALING METHODS -- SLABS (Multiple Answers Possible)										
Dwellings With Slabs										
Polyethylene/other membrn under slab	35.3%	56.6%	58.9%	42.4%	56.1%	69.1%	39.0%	5.6%	30.2%	44.7%
Membrane on frndtn. walls	9.0%	23.5%	23.2%	8.4%	6.3%	2.1%	2.0%	12.1%	5.6%	8.5%
Caulk around slab, wall opngs. & joints	19.6%	23.5%	6.8%	22.1%	6.3%	18.9%	11.5%	37.4%	26.2%	15.9%
Seal interior of foundation walls	9.0%	0.0%	0.8%	4.6%	3.1%	2.1%	8.5%	2.6%	1.1%	3.7%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	3.5%	0.3%	0.0%	0.0%	1.7%	0.0%	0.5%
Install air tight sump pit covers	0.0%	0.0%	32.0%	19.5%	0.0%	8.3%	0.0%	3.9%	0.0%	5.6%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
None	64.7%	43.4%	32.8%	7.5%	36.9%	23.5%	51.9%	48.3%	48.5%	39.9%
TOTAL (may exceed 100%)	137.6%	147.0%	154.5%	108.0%	109.0%	124.0%	112.9%	111.8%	111.5%	118.8%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)										
Dwellings On Basements And Slabs										
Crushed aggregate 4" or more deep	77.4%	85.1%	77.0%	85.4%	47.7%	65.0%	20.2%	87.3%	52.8%	56.3%
Crushed aggregate less than 4" deep	2.5%	6.2%	7.9%	3.7%	5.4%	10.4%	6.0%	4.3%	9.6%	6.3%
Sand	17.7%	2.5%	17.4%	18.3%	37.3%	18.6%	68.7%	16.5%	62.6%	37.1%
Strips of geotextile drainage mat	8.8%	0.6%	4.0%	2.1%	1.5%	0.6%	0.6%	8.3%	2.2%	2.4%
Sheets of rigid foam insulation	30.7%	32.9%	32.6%	23.2%	24.2%	18.6%	3.6%	32.4%	36.7%	23.1%
Perforated plastic pipe	32.5%	51.3%	39.2%	54.9%	22.9%	41.8%	2.0%	13.2%	17.3%	24.4%
Plastic sheet (vapor barrier)	41.2%	73.4%	64.5%	75.4%	80.2%	76.4%	62.6%	30.2%	62.2%	66.3%
Other	0.7%	4.1%	1.7%	7.2%	6.9%	16.6%	3.5%	7.8%	3.9%	5.8%
None	22.5%	8.4%	11.4%	10.0%	5.7%	2.9%	9.8%	8.6%	7.8%	8.4%
TOTAL (may exceed 100%)	233.9%	264.5%	255.8%	280.1%	231.8%	250.9%	177.0%	208.6%	255.2%	230.1%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)										
Dwellings On Basements										
Crushed aggregate 4" or more deep	75.3%	86.4%	76.4%	85.3%	63.6%	93.4%	13.6%	78.3%	71.7%	62.2%
Crushed aggregate less than 4" deep	2.5%	5.7%	8.1%	3.8%	8.4%	0.0%	4.9%	2.6%	4.5%	5.4%
Sand	16.1%	2.6%	15.3%	18.7%	13.6%	5.4%	82.7%	3.4%	46.6%	29.6%
Strips of geotextile drainage mat	6.2%	0.6%	4.4%	2.0%	2.1%	3.0%	9.2%	4.8%	11.6%	5.1%
Sheets of rigid foam insulation	28.6%	32.2%	28.5%	22.7%	22.9%	12.2%	5.7%	44.8%	47.2%	24.5%
Perforated plastic pipe	30.6%	53.3%	38.8%	54.6%	20.8%	46.8%	26.1%	26.4%	36.4%	32.4%
Plastic sheet (vapor barrier)	40.0%	74.1%	62.9%	75.1%	77.9%	77.8%	33.7%	42.6%	62.1%	60.9%
Other	0.8%	4.6%	2.0%	7.1%	8.8%	27.9%	0.0%	6.9%	20.1%	8.1%
None	22.9%	7.6%	12.4%	10.2%	30.0%	15.0%	54.1%	32.2%	25.6%	28.9%
TOTAL (may exceed 100%)	223.1%	267.2%	248.9%	279.6%	248.1%	281.5%	229.8%	242.1%	325.9%	257.2%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)										
Dwellings On Slabs										
Crushed aggregate 4" or more deep	100.0%	70.6%	64.6%	64.9%	35.4%	53.9%	20.5%	94.8%	53.7%	50.1%
Crushed aggregate less than 4" deep	0.0%	19.9%	11.4%	0.0%	0.6%	11.5%	6.2%	2.6%	12.0%	6.1%
Sand	21.1%	0.0%	33.8%	9.9%	53.4%	22.7%	67.7%	40.1%	73.4%	45.7%
Strips of geotextile drainage mat	42.9%	0.0%	0.0%	2.0%	0.5%	0.0%	0.4%	5.2%	0.0%	2.0%
Sheets of rigid foam insulation	53.4%	52.6%	68.4%	26.7%	29.8%	25.9%	3.5%	50.4%	39.0%	32.6%
Perforated plastic pipe	57.1%	26.8%	63.3%	37.3%	14.3%	29.1%	1.3%	3.9%	10.6%	19.7%
Plastic sheet (vapor barrier)	35.3%	79.8%	72.8%	54.5%	87.0%	72.6%	63.9%	36.9%	61.4%	68.1%
Other	0.0%	0.0%	0.0%	7.9%	3.4%	5.7%	3.7%	8.7%	5.2%	4.0%
None	32.3%	9.5%	32.3%	2.7%	3.9%	0.9%	8.8%	7.8%	1.7%	8.6%
TOTAL (may exceed 100%)	342.1%	259.2%	346.5%	205.8%	228.3%	222.5%	175.8%	250.3%	256.9%	237.0%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
COST OF PASSIVE SUB-SLAB VENTILATION										
Sample Size	39	47	80	92	70	26	19	25	25	423
Dwellings										
Less than \$200	15.3%	20.6%	33.1%	26.3%	37.9%	74.8%	43.8%	25.2%	51.4%	36.2%
\$200 to \$299	22.9%	38.3%	32.1%	34.6%	27.3%	7.8%	14.2%	8.6%	4.9%	25.6%
\$300 to \$399	9.5%	23.0%	16.1%	12.3%	15.4%	17.4%	27.2%	32.5%	30.8%	17.8%
\$400 to \$499	16.7%	10.2%	12.0%	7.3%	4.0%	0.0%	0.0%	1.8%	8.3%	6.1%
\$500 to \$599	29.3%	3.3%	1.2%	12.6%	12.5%	0.0%	14.8%	0.0%	3.2%	7.8%
\$600 to \$799	0.0%	0.9%	1.3%	1.6%	1.1%	0.0%	0.0%	3.7%	1.5%	1.3%
\$800 or greater	6.2%	3.8%	4.2%	5.3%	1.7%	0.0%	0.0%	28.2%	0.0%	5.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
COST OF ACTIVE SUB-SLAB VENTILATION										
Sample Size	12	22	35	40	29	10	5	14	10	177
Dwellings										
Less than \$450	0.0%	24.3%	18.2%	21.8%	43.4%	20.6%	0.0%	5.1%	10.3%	17.6%
\$450 to \$549	4.1%	44.5%	7.9%	18.1%	7.7%	58.8%	0.0%	0.0%	69.0%	21.6%
\$550 to \$649	42.6%	12.9%	9.7%	9.6%	15.2%	7.4%	0.0%	6.3%	0.0%	10.9%
\$650 to \$749	0.0%	2.7%	19.2%	7.2%	10.2%	0.0%	0.0%	12.9%	10.3%	10.2%
\$750 to \$849	27.0%	0.0%	27.5%	4.6%	0.0%	7.4%	0.0%	0.0%	0.0%	7.2%
\$850 to \$1049	4.1%	13.5%	15.5%	23.8%	0.2%	5.9%	0.0%	42.4%	10.3%	17.6%
\$1050 or greater	22.3%	2.1%	1.9%	15.0%	23.5%	0.0%	0.0%	33.3%	0.0%	14.8%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%

APPENDIX B

MULTIFAMILY USAGE COEFFICIENT TABLES BY THE NINE CENSUS DIVISIONS

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
SAMPLE SIZE										
Units	188	126	290	173	811	153	242	62	686	2731
Builders	18	10	26	18	28	12	16	9	23	160
WGHTD AVERAGE UNITS PER BLDR	10.5	12.6	11.2	9.6	28.9	12.8	15.1	6.9	29.8	18.6
TYPE OF HOUSE: WITH RADON REDUCING FEATURES										
One Story Dwellings With Basements										
With radon reducing features	4.2%	20.8%	3.2%	11.3%	0.4%	0.0%	0.0%	0.5%	0.0%	3.8%
No radon reducing features	33.1%	2.4%	20.8%	29.9%	4.2%	1.1%	2.9%	4.5%	4.3%	7.8%
One story Dwellings With Crawl Spaces										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.1%	0.0%	2.6%	6.0%	3.8%	15.5%	0.3%	0.2%	2.0%	2.6%
One Story Dwellings On Slabs										
With radon reducing features	0.0%	2.8%	2.3%	4.6%	3.6%	0.0%	1.2%	5.7%	0.0%	2.3%
No radon reducing features	5.6%	14.8%	31.3%	19.5%	15.5%	28.2%	41.0%	10.9%	29.3%	24.0%
Two Story Dwellings With Basements										
With radon reducing features	17.8%	20.3%	0.7%	0.6%	3.9%	0.0%	0.0%	0.6%	1.2%	4.2%
No radon reducing features	27.7%	19.9%	8.1%	13.6%	4.2%	1.2%	3.2%	20.7%	4.5%	8.8%
Two Story Dwellings With Crawl Spaces										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%
No radon reducing features	0.4%	0.0%	1.6%	0.0%	5.8%	10.3%	0.3%	0.2%	2.5%	2.4%
Two Story Dwellings On Slabs										
With radon reducing features	0.0%	3.9%	0.3%	4.6%	3.6%	11.7%	1.2%	6.3%	2.1%	3.2%
No radon reducing features	3.4%	6.5%	18.7%	5.8%	7.2%	17.9%	15.1%	35.8%	23.2%	14.7%
Three Story Dwellings With Basements										
With radon reducing features	1.4%	8.6%	0.2%	0.0%	0.2%	0.0%	0.0%	0.6%	0.0%	1.2%
No radon reducing features	3.7%	0.0%	2.7%	0.2%	4.2%	5.9%	3.5%	1.6%	4.7%	3.1%
Three Story Dwellings With Crawl Spaces										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.6%	0.0%	0.1%	0.0%	4.4%	0.1%	0.4%	0.2%	2.6%	1.5%
Three Story Dwellings On Slabs										
With radon reducing features	0.0%	0.0%	0.0%	1.2%	14.4%	0.0%	0.0%	6.9%	0.0%	3.7%
No radon reducing features	1.9%	0.0%	7.1%	2.6%	13.3%	8.0%	22.7%	5.0%	12.7%	10.8%
Houses on piers	0.1%	0.0%	0.4%	0.0%	11.4%	0.2%	8.0%	0.3%	10.6%	5.7%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS										
Basements										
With radon reducing features	23.5%	49.8%	4.1%	11.9%	5.0%	0.0%	0.0%	1.7%	1.3%	9.4%
No radon reducing features	64.5%	22.2%	31.7%	43.7%	14.2%	8.1%	10.4%	26.9%	15.1%	20.5%
Crawl Spaces										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.1%
No radon reducing features	1.1%	0.0%	4.3%	6.0%	15.8%	26.0%	1.2%	0.7%	7.9%	7.1%
Slabs on Grade										
With radon reducing features	0.0%	6.7%	2.5%	10.5%	24.4%	11.8%	2.7%	19.0%	2.3%	9.9%
No radon reducing features	11.0%	21.3%	57.4%	27.9%	40.6%	54.1%	85.7%	51.7%	72.9%	53.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS										
With radon reducing features	23.5%	56.5%	6.6%	22.4%	29.4%	11.8%	2.7%	20.7%	4.1%	19.4%
No radon reducing features	76.5%	43.5%	93.4%	77.6%	70.6%	88.2%	97.3%	79.3%	95.9%	80.6%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
TESTING OF DWELLINGS										
All Units										
Tested For Radon Levels	29.8%	44.1%	16.4%	19.9%	3.3%	1.2%	2.9%	0.4%	0.4%	10.6%
Tested Units Needing More Work	13.1%	24.7%	29.7%	13.5%	5.9%	0.0%	0.0%	82.4%	0.0%	20.4%
Units With Basements										
Tested For Radon Levels	23.9%	57.9%	16.6%	13.3%	6.1%	0.0%	0.0%	0.1%	0.4%	24.2%
Tested Units Needing More Work	18.0%	23.7%	25.5%	29.2%	16.8%	0.0%	0.0%	1.0%	0.0%	23.4%
Units With Crawl Spaces										
Tested For Radon Levels	100.0%	0.0%	31.6%	0.0%	0.8%	0.0%	0.0%	0.3%	2.1%	3.1%
Tested Units Needing More Work	10.0%	0.0%	16.3%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	11.3%
Units With Slabs										
Tested For Radon Levels	69.8%	8.9%	15.2%	32.6%	3.1%	1.8%	3.3%	0.5%	0.2%	5.5%
Tested Units Needing More Work	0.0%	42.8%	34.5%	4.2%	0.0%	0.0%	0.0%	86.9%	0.0%	14.5%
CONSTRUCTION METHOD										
DWELLINGS WITH RADON REDUCING FEATURES										
Conventional Constructed On Site										
With radon reducing features	23.5%	56.5%	6.6%	22.4%	29.4%	11.8%	2.7%	20.7%	4.1%	19.4%
No radon reducing features	76.5%	43.5%	93.4%	77.6%	70.6%	88.2%	97.3%	79.3%	95.9%	80.6%
Prefabricated Units (Panelized)										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Modular										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ALL Dwellings										
With radon reducing features	23.5%	56.5%	6.6%	22.4%	29.4%	11.8%	2.7%	20.7%	4.1%	19.4%
No radon reducing features	76.5%	43.5%	93.4%	77.6%	70.6%	88.2%	97.3%	79.3%	95.9%	80.6%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SIZE OF BUILDER										
DWELLINGS WITH RADON REDUCING FEATURES										
One to Ten Dwellings Per Year										
With radon reducing features	9.0%	9.7%	3.1%	11.9%	3.7%	0.0%	2.7%	20.7%	0.0%	5.4%
No radon reducing features	17.0%	5.5%	15.0%	6.6%	4.6%	14.4%	16.0%	59.6%	4.9%	12.9%
Eleven To Twenty-Five Dwellings Per Year										
With radon reducing features	14.4%	18.6%	1.5%	10.5%	2.8%	11.8%	0.0%	0.0%	0.0%	4.8%
No radon reducing features	29.2%	17.8%	30.9%	40.0%	10.6%	38.9%	4.3%	19.8%	9.2%	16.6%
Twenty-Six To 100 Dwellings Per Year										
With radon reducing features	0.0%	28.1%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.1%	4.3%
No radon reducing features	30.4%	20.2%	47.5%	31.0%	14.3%	35.0%	77.0%	0.0%	48.7%	36.8%
Over 100 Dwellings Per Year										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	22.9%	0.0%	0.0%	0.0%	0.0%	4.9%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	41.1%	0.0%	0.0%	0.0%	33.1%	14.2%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
METHODS EMPLOYED TO REDUCE RADON										
Dwellings With Basements										
Rough-in for subslab ventilation	20.7%	7.2%	18.2%	24.5%	0.2%	0.0%	0.0%	0.0%	0.0%	4.9%
Passive stack subslab ventilation	19.2%	31.1%	2.5%	10.7%	4.5%	0.0%	0.0%	1.6%	0.0%	6.5%
Fan-driven subslab depressurization	4.3%	18.6%	1.6%	1.2%	0.5%	0.0%	0.0%	0.0%	1.3%	2.9%
Only sealed entry routes	7.4%	2.4%	5.9%	5.5%	0.4%	0.0%	5.6%	0.0%	0.0%	2.6%
None	36.4%	12.7%	7.6%	13.8%	13.6%	8.1%	4.8%	26.9%	15.1%	13.1%
SUBTOTAL -- BASEMENTS	88.0%	72.0%	35.8%	55.6%	19.2%	8.1%	10.4%	28.6%	16.4%	29.9%
Dwellings With Crawl Spaces										
Passive stack subslab ventilation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%
Fan-driven (active) ventilation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
Foundation Wall Vents	0.0%	0.0%	0.0%	6.0%	13.5%	0.0%	0.0%	0.0%	2.0%	3.6%
None	1.1%	0.0%	4.3%	0.0%	2.3%	26.0%	1.2%	0.7%	5.9%	3.4%
SUBTOTAL -- CRAWL SPACES	1.1%	0.0%	4.3%	6.0%	15.8%	26.0%	1.2%	0.7%	8.4%	7.2%
Dwellings With Slabs										
Rough-in for subslab ventilation	7.3%	13.0%	24.6%	6.6%	14.7%	0.0%	0.0%	0.0%	0.0%	7.6%
Passive stack subslab ventilation	0.0%	6.7%	0.7%	10.5%	23.9%	11.8%	2.7%	4.4%	0.0%	8.1%
Fan-driven subslab depressurization	0.0%	0.0%	1.9%	0.0%	0.5%	0.0%	0.0%	14.6%	2.3%	1.7%
Only sealed entry routes	2.1%	8.3%	14.6%	19.1%	13.7%	17.5%	52.9%	0.0%	26.6%	21.6%
None	1.6%	0.0%	18.2%	2.3%	12.3%	36.6%	32.9%	51.8%	46.3%	23.8%
SUBTOTAL -- SLABS	11.0%	28.0%	59.9%	38.4%	65.0%	65.9%	88.4%	70.8%	75.2%	62.9%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS (Multiple Answers Possible)										
Dwellings With Basements										
Polyethylene/other membrn under slab	42.2%	49.9%	61.9%	65.9%	24.4%	0.0%	0.0%	0.0%	0.0%	22.7%
Membrane on frndtn. walls	6.0%	42.6%	5.8%	47.1%	0.0%	0.0%	54.1%	5.8%	0.0%	19.6%
Caulk around slab, wall opngs. & joints	15.7%	36.0%	34.6%	5.2%	21.2%	0.0%	0.0%	0.0%	8.1%	14.2%
Seal interior of foundation walls	0.0%	0.0%	24.6%	3.1%	6.4%	0.0%	0.0%	0.0%	0.0%	3.7%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Install air tight sump pit covers	0.0%	53.7%	29.7%	6.3%	23.4%	0.0%	0.0%	0.0%	0.0%	14.6%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
None	51.7%	43.5%	24.8%	30.0%	70.9%	100.0%	46.0%	94.2%	91.9%	62.1%
TOTAL (may exceed 100%)	115.7%	225.6%	181.3%	157.5%	146.2%	100.0%	100.0%	100.0%	100.0%	136.8%
SEALING METHODS -- SLABS (Multiple Answers Possible)										
Dwellings With Slabs										
Polyethylene/other membrn under slab	19.3%	70.5%	59.1%	94.1%	36.5%	26.6%	45.9%	0.0%	35.4%	44.4%
Membrane on frndtn. walls	0.0%	29.6%	1.6%	46.4%	0.0%	0.0%	17.0%	6.2%	2.0%	10.9%
Caulk around slab, wall opngs. & joints	0.0%	29.6%	32.8%	47.0%	21.9%	20.6%	22.0%	0.0%	3.0%	20.0%
Seal interior of foundation walls	0.0%	0.0%	11.2%	0.0%	0.7%	0.0%	19.2%	20.7%	0.0%	6.2%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Install air tight sump pit covers	0.0%	51.7%	25.2%	47.0%	42.2%	20.6%	0.0%	0.0%	0.0%	21.8%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
None	80.7%	0.0%	30.4%	5.9%	19.6%	73.4%	37.2%	73.1%	61.6%	36.1%
TOTAL (may exceed 100%)	100.0%	181.3%	160.3%	240.4%	120.9%	141.3%	141.2%	100.0%	102.0%	139.4%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)										
Dwellings On Basements And Slabs										
Crushed aggregate 4" or more deep	63.0%	79.1%	82.7%	100.0%	76.3%	76.0%	7.7%	73.2%	69.5%	64.4%
Crushed aggregate less than 4" deep	5.4%	8.3%	16.0%	0.0%	0.0%	0.0%	0.0%	26.8%	11.1%	6.4%
Sand	2.2%	9.6%	6.5%	16.3%	24.9%	7.1%	48.2%	0.0%	59.8%	27.3%
Strips of geotextile drainage mat	16.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	0.8%
Sheets of rigid foam insulation	33.6%	69.0%	48.2%	23.5%	62.7%	55.9%	0.0%	35.2%	24.4%	38.2%
Perforated plastic pipe	26.9%	75.9%	26.8%	98.2%	22.0%	21.9%	2.7%	0.0%	0.0%	25.6%
Plastic sheet (vapor barrier)	35.6%	81.8%	58.8%	84.2%	43.9%	85.9%	39.6%	16.2%	63.2%	54.8%
Other	4.3%	9.6%	0.0%	1.2%	0.3%	12.4%	42.2%	19.4%	0.0%	11.3%
None	50.0%	13.5%	19.3%	7.0%	1.0%	12.8%	11.3%	12.1%	18.8%	12.4%
TOTAL (may exceed 100%)	237.7%	346.6%	258.3%	330.3%	231.1%	271.9%	151.7%	182.9%	248.5%	241.3%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)										
Dwellings On Basements										
Crushed aggregate 4" or more deep	60.8%	70.9%	89.0%	100.0%	98.0%	100.0%	0.0%	84.6%	85.6%	71.8%
Crushed aggregate less than 4" deep	3.6%	11.5%	7.6%	0.0%	0.0%	0.0%	0.0%	15.4%	0.0%	3.3%
Sand	0.6%	13.3%	17.4%	7.3%	4.3%	0.0%	54.1%	0.0%	29.0%	19.3%
Strips of geotextile drainage mat	18.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Sheets of rigid foam insulation	33.6%	61.4%	52.1%	3.1%	24.6%	100.0%	0.0%	5.8%	8.1%	25.4%
Perforated plastic pipe	28.5%	82.4%	49.1%	96.9%	21.2%	0.0%	0.0%	0.0%	0.0%	26.6%
Plastic sheet (vapor barrier)	35.8%	74.7%	57.4%	77.3%	24.4%	100.0%	0.0%	56.4%	29.0%	39.9%
Other	4.8%	13.3%	0.0%	2.1%	0.0%	0.0%	43.2%	15.4%	0.0%	11.0%
None	54.4%	18.7%	0.0%	0.0%	2.0%	0.0%	100.0%	26.6%	68.8%	36.2%
TOTAL (may exceed 100%)	241.0%	346.1%	272.5%	286.7%	174.5%	300.0%	197.3%	204.1%	220.6%	234.3%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)										
Dwellings On Slabs										
Crushed aggregate 4" or more deep	80.7%	100.0%	79.0%	100.0%	69.9%	73.0%	8.6%	68.6%	66.0%	64.9%
Crushed aggregate less than 4" deep	19.3%	0.0%	21.0%	0.0%	0.0%	0.0%	0.0%	31.4%	13.5%	7.1%
Sand	14.5%	0.0%	0.0%	29.4%	31.0%	7.9%	47.5%	0.0%	66.5%	29.2%
Strips of geotextile drainage mat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.3%
Sheets of rigid foam insulation	33.8%	88.6%	45.9%	52.8%	73.9%	50.4%	0.0%	47.1%	28.0%	46.1%
Perforated plastic pipe	14.5%	59.1%	13.5%	100.0%	22.2%	24.6%	3.0%	0.0%	0.0%	22.4%
Plastic sheet (vapor barrier)	33.8%	100.0%	59.6%	94.1%	49.7%	84.1%	44.2%	0.0%	70.7%	59.7%
Other	0.0%	0.0%	0.0%	0.0%	0.4%	13.9%	42.1%	21.1%	0.0%	10.1%
None	14.5%	0.0%	30.8%	17.1%	0.7%	14.4%	0.9%	6.2%	7.9%	7.2%
TOTAL (may exceed 100%)	211.2%	347.7%	249.8%	393.4%	247.8%	268.4%	146.3%	174.4%	254.6%	247.0%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
COST OF PASSIVE SUB-SLAB VENTILATION										
Sample Size	9	6	12	11	12	0	2	1	0	53
Dwellings										
Less than \$200	20.0%	4.5%	35.5%	55.7%	17.2%	0.0%	0.0%	0.0%	0.0%	15.7%
\$200 to \$299	23.2%	68.3%	19.2%	26.7%	54.2%	0.0%	0.0%	0.0%	26.9%	48.0%
\$300 to \$399	12.6%	6.8%	10.8%	11.5%	0.0%	0.0%	0.0%	100.0%	0.0%	7.1%
\$400 to \$499	0.0%	0.0%	34.5%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0%	1.4%
\$500 to \$599	33.7%	14.6%	0.0%	2.7%	26.9%	0.0%	100.0%	0.0%	0.0%	20.8%
\$600 to \$799	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
\$800 or greater	10.5%	5.9%	0.0%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	26.9%	95.6%
COST OF ACTIVE SUB-SLAB VENTILATION										
Sample Size	6	0	8	0	3	0	0	0	1	18
Dwellings										
Less than \$450	0.0%	53.2%	40.6%	0.0%	90.4%	0.0%	0.0%	0.0%	0.0%	32.2%
\$450 to \$549	0.0%	0.0%	0.0%	55.6%	0.0%	0.0%	0.0%	0.0%	100.0%	13.8%
\$550 to \$649	49.1%	0.0%	22.2%	0.0%	6.4%	0.0%	0.0%	0.0%	0.0%	3.2%
\$650 to \$749	0.0%	8.5%	35.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.4%
\$750 to \$849	0.0%	0.0%	2.2%	0.0%	3.3%	0.0%	0.0%	0.0%	0.0%	0.3%
\$850 to \$1049	38.2%	21.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.4%
\$1050 or greater	12.7%	0.0%	0.0%	44.4%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
TOTAL	100.0%	83.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	100.0%	68.4%

APPENDIX C

SINGLE-FAMILY DETACHED USAGE COEFFICIENT TABLES

BY THE 32 STATE-MARKET-AREAS

	CT & RI & MA	ME & NH & VT	NEW ENG
SAMPLE SIZE			
Units	130	56	186
Builders	51	30	81
WGHTD AVERAGE UNITS PER BLDR	2.5	1.9	2.3
TYPE OF HOUSE: WITH RADON REDUCING FEATURES			
One Story Dwellings With Basements			
With radon reducing features	10.6%	3.0%	7.8%
No radon reducing features	24.4%	37.4%	29.2%
One story Dwellings With Crawl Spaces			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.6%	0.0%	0.4%
One Story Dwellings On Slabs			
With radon reducing features	0.3%	7.1%	2.8%
No radon reducing features	2.3%	1.8%	2.1%
Two Story Dwellings With Basements			
With radon reducing features	14.4%	5.9%	11.3%
No radon reducing features	42.9%	41.1%	42.3%
Two Story Dwellings With Crawl Spaces			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.1%	0.0%	0.1%
Two Story Dwellings On Slabs			
With radon reducing features	0.1%	1.8%	0.7%
No radon reducing features	0.4%	1.8%	0.9%
Three Story Dwellings With Basements			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	3.1%	0.0%	1.9%
Three Story Dwellings With Crawl Spaces			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%
Three Story Dwellings On Slabs			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%
Houses on piers	0.8%	0.0%	0.5%
TOTAL	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS			
Basements			
With radon reducing features	25.2%	8.9%	19.2%
No radon reducing features	70.9%	78.6%	73.7%
Crawl Spaces			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.7%	0.0%	0.4%
Slabs on Grade			
With radon reducing features	0.5%	8.9%	3.6%
No radon reducing features	2.7%	3.6%	3.0%
TOTAL	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS			
With radon reducing features	25.7%	17.9%	22.8%
No radon reducing features	74.3%	82.1%	77.2%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%

	CT & RI & MA	ME & NH & VT	NEW ENG
TESTING OF DWELLINGS			
All Units			
Tested For Radon Levels	52.8%	20.1%	40.7%
Tested Units Needing More Work	12.8%	13.3%	12.9%
Units With Basements			
Tested For Radon Levels	53.6%	16.8%	40.8%
Tested Units Needing More Work	13.1%	18.2%	13.8%
Units With Crawl Spaces			
Tested For Radon Levels	31.4%	0.0%	31.4%
Tested Units Needing More Work	0.0%	0.0%	0.0%
Units With Slabs			
Tested For Radon Levels	31.4%	42.9%	39.4%
Tested Units Needing More Work	0.0%	0.0%	0.0%
CONSTRUCTION METHOD			
DWELLINGS WITH RADON REDUCING FEATURES			
Conventional Constructed On Site			
With radon reducing features	25.7%	17.9%	22.8%
No radon reducing features	74.3%	82.1%	77.2%
Prefabricated Units (Panelized)			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%
Modular			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%
ALL Dwellings			
With radon reducing features	25.7%	17.9%	22.8%
No radon reducing features	74.3%	82.1%	77.2%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%
SIZE OF BUILDER			
DWELLINGS WITH RADON REDUCING FEATURES			
One to Ten Dwellings Per Year			
With radon reducing features	25.7%	17.9%	22.8%
No radon reducing features	56.6%	55.4%	56.1%
Eleven To Twenty-Five Dwellings Per Year			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	7.7%	10.7%	8.8%
Twenty-Six To 100 Dwellings Per Year			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	10.0%	16.1%	12.2%
Over 100 Dwellings Per Year			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%

	CT & RI & MA	ME & NH & VT	NEW ENG
METHODS EMPLOYED TO REDUCE RADON			
Dwellings With Basements			
Rough-in for subslab ventilation	43.1%	33.9%	39.7%
Passive stack subslab ventilation	16.8%	7.1%	13.2%
Fan-driven subslab depressurization	8.5%	1.8%	6.0%
Only sealed entry routes	7.3%	1.8%	5.3%
None	20.5%	42.9%	28.7%
SUBTOTAL -- BASEMENTS	96.2%	87.5%	93.0%
Dwellings With Crawl Spaces			
Passive stack subslab ventilation	0.0%	0.0%	0.0%
Fan-driven (active) ventilation	0.0%	0.0%	0.0%
Foundation Wall Vents	0.0%	0.0%	0.0%
None	0.7%	0.0%	0.4%
SUBTOTAL -- CRAWL SPACES	0.7%	0.0%	0.4%
Dwellings With Slabs			
Rough-in for subslab ventilation	0.0%	0.0%	0.0%
Passive stack subslab ventilation	0.5%	5.4%	2.3%
Fan-driven subslab depressurization	0.0%	3.6%	1.3%
Only sealed entry routes	0.0%	0.0%	0.0%
None	2.7%	3.6%	3.0%
SUBTOTAL -- SLABS	3.2%	12.5%	6.6%
TOTAL	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS			
(Multiple Answers Possible)			
Dwellings With Basements			
Polyethylene/other membrn under slab	26.6%	24.5%	25.8%
Membrane on fndtn. walls	4.2%	18.4%	9.4%
Caulk around slab, wall opngs. & joints	13.8%	12.2%	13.2%
Seal interior of foundation walls	10.6%	0.0%	6.7%
Locate sump access outside of bsmt.	1.6%	0.0%	1.0%
Install air tight sump pit covers	8.8%	6.1%	7.8%
Other	5.6%	0.0%	3.5%
None	59.8%	57.1%	58.8%
TOTAL (may exceed 100%)	131.1%	118.4%	126.4%
SEALING METHODS -- SLABS			
(Multiple Answers Possible)			
Dwellings With Slabs			
Polyethylene/other membrn under slab	14.3%	71.4%	35.3%
Membrane on fndtn. walls	14.3%	0.0%	9.0%
Caulk around slab, wall opngs. & joints	14.3%	28.6%	19.6%
Seal interior of foundation walls	14.3%	0.0%	9.0%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%
Install air tight sump pit covers	0.0%	0.0%	0.0%
Other	0.0%	0.0%	0.0%
None	85.7%	28.6%	64.7%
TOTAL (may exceed 100%)	142.9%	128.6%	137.6%

	CT & RI & MA	ME & NH & VT	NEW ENG
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)			
Dwellings On Basements And Slabs			
Crushed aggregate 4" or more deep	83.0%	67.9%	77.4%
Crushed aggregate less than 4" deep	3.9%	0.0%	2.5%
Sand	15.5%	21.4%	17.7%
Strips of geotextile drainage mat	9.7%	7.1%	8.8%
Sheets of rigid foam insulation	26.8%	37.5%	30.7%
Perforated plastic pipe	33.7%	30.4%	32.5%
Plastic sheet (vapor barrier)	43.3%	37.5%	41.2%
Other	0.0%	1.8%	0.7%
None	16.9%	32.1%	22.5%
TOTAL (may exceed 100%)	232.8%	235.7%	233.9%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)			
Dwellings On Basements			
Crushed aggregate 4" or more deep	82.4%	63.3%	75.3%
Crushed aggregate less than 4" deep	4.0%	0.0%	2.5%
Sand	16.0%	16.3%	16.1%
Strips of geotextile drainage mat	8.7%	2.0%	6.2%
Sheets of rigid foam insulation	26.3%	32.7%	28.6%
Perforated plastic pipe	32.9%	26.5%	30.6%
Plastic sheet (vapor barrier)	44.3%	32.7%	40.0%
Other	0.0%	2.0%	0.8%
None	16.1%	34.7%	22.9%
TOTAL (may exceed 100%)	230.6%	210.2%	223.1%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)			
Dwellings On Slabs			
Crushed aggregate 4" or more deep	100.0%	100.0%	100.0%
Crushed aggregate less than 4" deep	0.0%	0.0%	0.0%
Sand	0.0%	57.1%	21.1%
Strips of geotextile drainage mat	42.9%	42.9%	42.9%
Sheets of rigid foam insulation	42.9%	71.4%	53.4%
Perforated plastic pipe	57.1%	57.1%	57.1%
Plastic sheet (vapor barrier)	14.3%	71.4%	35.3%
Other	0.0%	0.0%	0.0%
None	42.9%	14.3%	32.3%
TOTAL (may exceed 100%)	300.0%	414.3%	342.1%

	CT & RI & MA	ME & NH & VT	NEW ENG
COST OF PASSIVE SUB-SLAB VENTILATION			
Sample Size	26	13	39
Dwellings			
Less than \$200	14.7%	16.7%	15.3%
\$200 to \$299	16.2%	38.9%	22.9%
\$300 to \$399	8.8%	11.1%	9.5%
\$400 to \$499	19.1%	11.1%	16.7%
\$500 to \$599	32.4%	22.2%	29.3%
\$600 to \$799	0.0%	0.0%	0.0%
\$800 or greater	8.8%	0.0%	6.2%
TOTAL	100.0%	100.0%	100.0%
COST OF ACTIVE SUB-SLAB VENTILATION			
Sample Size	11	1	12
Dwellings			
Less than \$450	0.0%	0.0%	0.0%
\$450 to \$549	5.6%	0.0%	4.1%
\$550 to \$649	58.3%	0.0%	42.6%
\$650 to \$749	0.0%	0.0%	0.0%
\$750 to \$849	0.0%	100.0%	27.0%
\$850 to \$1049	5.6%	0.0%	4.1%
\$1050 or greater	30.6%	0.0%	22.3%
TOTAL	100.0%	100.0%	100.0%

	NJ	NY	PA	MID ATL
SAMPLE SIZE				
Units	73	158	123	354
Builders	32	40	49	121
WGHTD AVERAGE UNITS PER BLDR	2.3	3.9	2.5	2.9
TYPE OF HOUSE: WITH RADON REDUCING FEATURES				
One Story Dwellings With Basements				
With radon reducing features	0.0%	2.0%	11.7%	6.1%
No radon reducing features	15.1%	33.5%	33.3%	29.0%
One story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	2.7%	1.0%	0.8%	1.3%
One Story Dwellings On Slabs				
With radon reducing features	0.0%	0.0%	0.5%	0.3%
No radon reducing features	0.0%	4.7%	0.8%	1.8%
Two Story Dwellings With Basements				
With radon reducing features	21.9%	11.2%	17.9%	16.9%
No radon reducing features	37.0%	42.5%	34.6%	37.5%
Two Story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	6.8%	1.5%	0.0%	2.1%
Two Story Dwellings On Slabs				
With radon reducing features	0.0%	0.0%	0.3%	0.1%
No radon reducing features	13.7%	0.7%	0.0%	3.5%
Three Story Dwellings With Basements				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.6%	0.0%	0.2%
Three Story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	2.7%	0.0%	0.0%	0.7%
Three Story Dwellings On Slabs				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%
Houses on piers	0.0%	2.2%	0.0%	0.6%
TOTAL	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS				
Basements				
With radon reducing features	21.9%	13.5%	29.6%	23.1%
No radon reducing features	52.1%	78.4%	68.0%	67.2%
Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	12.3%	2.5%	0.8%	4.1%
Slabs on Grade				
With radon reducing features	0.0%	0.0%	0.8%	0.4%
No radon reducing features	13.7%	5.6%	0.8%	5.3%
TOTAL	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS				
With radon reducing features	21.9%	13.5%	30.4%	23.5%
No radon reducing features	78.1%	86.5%	69.6%	76.5%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%

	NJ	NY	PA	MID ATL
TESTING OF DWELLINGS				
All Units				
Tested For Radon Levels	40.4%	10.8%	25.9%	24.9%
Tested Units Needing More Work	5.1%	0.0%	28.8%	16.0%
Units With Basements				
Tested For Radon Levels	38.0%	11.8%	26.1%	24.2%
Tested Units Needing More Work	7.3%	0.0%	29.2%	18.3%
Units With Crawl Spaces				
Tested For Radon Levels	100.0%	0.0%	0.0%	72.7%
Tested Units Needing More Work	0.0%	0.0%	0.0%	0.0%
Units With Slabs				
Tested For Radon Levels	0.0%	0.0%	25.0%	3.4%
Tested Units Needing More Work	0.0%	0.0%	5.0%	5.0%
CONSTRUCTION METHOD				
DWELLINGS WITH RADON REDUCING FEATURES				
Conventional Constructed On Site				
With radon reducing features	21.9%	13.5%	30.4%	23.5%
No radon reducing features	78.1%	86.5%	69.6%	76.5%
Prefabricated Units (Panelized)				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%
Modular				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%
ALL Dwellings				
With radon reducing features	21.9%	13.5%	30.4%	23.5%
No radon reducing features	78.1%	86.5%	69.6%	76.5%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%
SIZE OF BUILDER				
DWELLINGS WITH RADON REDUCING FEATURES				
One to Ten Dwellings Per Year				
With radon reducing features	21.9%	12.3%	30.4%	23.1%
No radon reducing features	68.5%	48.4%	48.5%	53.2%
Eleven To Twenty-Five Dwellings Per Year				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	9.6%	15.2%	21.1%	16.7%
Twenty-Six To 100 Dwellings Per Year				
With radon reducing features	0.0%	1.3%	0.0%	0.4%
No radon reducing features	0.0%	10.2%	0.0%	3.0%
Over 100 Dwellings Per Year				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	12.7%	0.0%	3.7%

	NJ	NY	PA	MID ATL
METHODS EMPLOYED TO REDUCE RADON				
Dwellings With Basements				
Rough-in for subslab ventilation	13.7%	16.5%	34.3%	24.2%
Passive stack subslab ventilation	13.7%	12.7%	27.1%	19.7%
Fan-driven subslab depressurization	8.2%	0.8%	2.5%	3.4%
Only sealed entry routes	9.6%	30.5%	18.7%	20.0%
None	28.8%	31.3%	15.0%	23.0%
SUBTOTAL -- BASEMENTS	74.0%	91.9%	97.6%	90.3%
Dwellings With Crawl Spaces				
Passive stack subslab ventilation	0.0%	0.0%	0.0%	0.0%
Fan-driven (active) ventilation	0.0%	0.0%	0.0%	0.0%
Foundation Wall Vents	2.7%	0.0%	0.0%	0.7%
None	9.6%	2.5%	0.8%	3.4%
SUBTOTAL -- CRAWL SPACES	12.3%	2.5%	0.8%	4.1%
Dwellings With Slabs				
Rough-in for subslab ventilation	0.0%	0.0%	0.0%	0.0%
Passive stack subslab ventilation	0.0%	0.0%	0.8%	0.4%
Fan-driven subslab depressurization	0.0%	0.0%	0.0%	0.0%
Only sealed entry routes	5.5%	0.0%	0.8%	1.7%
None	8.2%	5.6%	0.0%	3.6%
SUBTOTAL -- SLABS	13.7%	5.6%	1.6%	5.7%
TOTAL	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS				
(Multiple Answers Possible)				
Dwellings With Basements				
Polyethylene/other membrn under slab	48.2%	44.6%	73.3%	58.9%
Membrane on frndtn. walls	7.4%	18.7%	2.5%	8.4%
Caulk around slab, wall opngs. & joints	25.9%	6.6%	22.5%	18.7%
Seal interior of foundation walls	5.6%	3.1%	3.3%	3.8%
Locate sump access outside of bsmt.	9.3%	0.0%	0.0%	2.2%
Install air tight sump pit covers	29.6%	0.7%	27.5%	20.2%
Other	0.0%	0.0%	0.0%	0.0%
None	46.3%	48.5%	24.2%	36.5%
TOTAL (may exceed 100%)	172.2%	122.1%	153.3%	148.8%
SEALING METHODS -- SLABS				
(Multiple Answers Possible)				
Dwellings With Slabs				
Polyethylene/other membrn under slab	40.0%	0.0%	100.0%	56.6%
Membrane on frndtn. walls	0.0%	0.0%	50.0%	23.5%
Caulk around slab, wall opngs. & joints	0.0%	0.0%	50.0%	23.5%
Seal interior of foundation walls	0.0%	0.0%	0.0%	0.0%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	0.0%
Install air tight sump pit covers	0.0%	0.0%	0.0%	0.0%
Other	0.0%	0.0%	0.0%	0.0%
None	60.0%	100.0%	0.0%	43.4%
TOTAL (may exceed 100%)	100.0%	100.0%	200.0%	147.0%

	NJ	NY	PA	MID ATL
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)				
Dwellings On Basements And Slabs				
Crushed aggregate 4" or more deep	70.3%	79.8%	95.9%	85.1%
Crushed aggregate less than 4" deep	12.5%	7.2%	2.5%	6.2%
Sand	0.0%	8.5%	0.0%	2.5%
Strips of geotextile drainage mat	0.0%	0.7%	0.8%	0.6%
Sheets of rigid foam insulation	14.1%	31.3%	43.4%	32.9%
Perforated plastic pipe	28.1%	53.8%	61.5%	51.3%
Plastic sheet (vapor barrier)	70.3%	47.6%	91.0%	73.4%
Other	7.8%	7.8%	0.0%	4.1%
None	17.2%	8.1%	4.1%	8.4%
TOTAL (may exceed 100%)	220.3%	244.6%	299.2%	264.5%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)				
Dwellings On Basements				
Crushed aggregate 4" or more deep	72.2%	82.7%	95.8%	86.4%
Crushed aggregate less than 4" deep	14.8%	3.5%	2.5%	5.7%
Sand	0.0%	9.0%	0.0%	2.6%
Strips of geotextile drainage mat	0.0%	0.7%	0.8%	0.6%
Sheets of rigid foam insulation	16.7%	27.1%	43.3%	32.2%
Perforated plastic pipe	33.3%	56.3%	61.7%	53.3%
Plastic sheet (vapor barrier)	75.9%	45.6%	90.8%	74.1%
Other	9.3%	8.3%	0.0%	4.6%
None	13.0%	8.6%	4.2%	7.6%
TOTAL (may exceed 100%)	235.2%	241.8%	299.2%	267.2%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)				
Dwellings On Slabs				
Crushed aggregate 4" or more deep	60.0%	31.7%	100.0%	70.6%
Crushed aggregate less than 4" deep	0.0%	68.4%	0.0%	19.9%
Sand	0.0%	0.0%	0.0%	0.0%
Strips of geotextile drainage mat	0.0%	0.0%	0.0%	0.0%
Sheets of rigid foam insulation	0.0%	100.0%	50.0%	52.6%
Perforated plastic pipe	0.0%	11.4%	50.0%	26.8%
Plastic sheet (vapor barrier)	40.0%	79.8%	100.0%	79.8%
Other	0.0%	0.0%	0.0%	0.0%
None	40.0%	0.0%	0.0%	9.5%
TOTAL (may exceed 100%)	140.0%	291.1%	300.0%	259.2%

	NJ	NY	PA	MID ATL
COST OF PASSIVE SUB-SLAB VENTILATION				
Sample Size	10	8	29	47
Dwellings				
Less than \$200	25.0%	27.9%	17.4%	20.6%
\$200 to \$299	8.3%	41.2%	44.9%	38.3%
\$300 to \$399	16.7%	27.9%	23.2%	23.0%
\$400 to \$499	33.3%	0.0%	7.3%	10.2%
\$500 to \$599	12.5%	1.5%	1.5%	3.3%
\$600 to \$799	0.0%	0.0%	1.5%	0.9%
\$800 or greater	4.2%	1.5%	4.4%	3.8%
TOTAL	100.0%	100.0%	100.0%	100.0%
 COST OF ACTIVE SUB-SLAB VENTILATION				
Sample Size	10	3	9	22
Dwellings				
Less than \$450	20.8%	70.6%	20.5%	24.3%
\$450 to \$549	58.3%	0.0%	30.8%	44.5%
\$550 to \$649	8.3%	0.0%	23.1%	12.9%
\$650 to \$749	0.0%	0.0%	7.7%	2.7%
\$750 to \$849	0.0%	0.0%	0.0%	0.0%
\$850 to \$1049	12.5%	0.0%	18.0%	13.5%
\$1050 or greater	0.0%	29.4%	0.0%	2.1%
TOTAL	100.0%	100.0%	100.0%	100.0%

	IL	IN	MI	OH	WI	E N CEN
SAMPLE SIZE						
Units	185	177	118	192	199	871
Builders	32	47	43	37	40	199
WGHTD AVERAGE UNITS PER BLDR	5.8	3.8	2.7	5.2	5.0	4.4
TYPE OF HOUSE: WITH RADON REDUCING FEATURES						
One Story Dwellings With Basements						
With radon reducing features	8.8%	6.3%	8.8%	10.2%	30.1%	12.1%
No radon reducing features	43.7%	35.8%	37.5%	30.5%	31.3%	35.5%
One story Dwellings With Crawl Spaces						
With radon reducing features	2.7%	11.9%	2.8%	0.0%	0.8%	3.9%
No radon reducing features	2.7%	6.3%	6.0%	1.3%	1.6%	3.7%
One Story Dwellings On Slabs						
With radon reducing features	0.0%	0.6%	0.2%	0.2%	0.7%	0.3%
No radon reducing features	0.5%	16.1%	3.6%	5.4%	0.9%	6.0%
Two Story Dwellings With Basements						
With radon reducing features	6.9%	1.7%	8.7%	14.4%	16.3%	9.3%
No radon reducing features	33.1%	14.7%	21.8%	37.4%	13.9%	24.4%
Two Story Dwellings With Crawl Spaces						
With radon reducing features	1.1%	0.7%	0.6%	0.0%	0.8%	0.6%
No radon reducing features	0.5%	2.9%	8.6%	0.5%	1.4%	2.8%
Two Story Dwellings On Slabs						
With radon reducing features	0.0%	0.0%	0.2%	0.0%	0.5%	0.1%
No radon reducing features	0.0%	1.9%	0.2%	0.1%	0.5%	0.6%
Three Story Dwellings With Basements						
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%
No radon reducing features	0.0%	0.0%	0.9%	0.0%	0.6%	0.3%
Three Story Dwellings With Crawl Spaces						
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Three Story Dwellings On Slabs						
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
Houses on piers	0.0%	1.1%	0.0%	0.1%	0.1%	0.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS						
Basements						
With radon reducing features	15.7%	8.1%	17.5%	24.6%	46.9%	21.5%
No radon reducing features	76.8%	51.1%	60.2%	67.9%	45.9%	60.3%
Crawl Spaces						
With radon reducing features	3.8%	12.8%	3.4%	0.0%	1.6%	4.6%
No radon reducing features	3.2%	9.3%	14.6%	1.9%	3.1%	6.5%
Slabs on Grade						
With radon reducing features	0.0%	0.6%	0.4%	0.2%	1.2%	0.5%
No radon reducing features	0.5%	18.3%	3.9%	5.5%	1.4%	6.6%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS						
With radon reducing features	19.5%	21.4%	21.3%	24.7%	49.7%	26.5%
No radon reducing features	80.5%	78.6%	78.7%	75.3%	50.3%	73.5%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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TESTING OF DWELLINGS						
All Units						
Tested For Radon Levels	41.1%	11.4%	24.9%	12.7%	23.4%	21.5%
Tested Units Needing More Work	55.1%	10.3%	10.3%	19.6%	9.2%	26.2%
Units With Basements						
Tested For Radon Levels	44.5%	6.3%	25.9%	12.7%	24.8%	22.6%
Tested Units Needing More Work	55.1%	31.5%	12.8%	18.2%	9.3%	30.0%
Units With Crawl Spaces						
Tested For Radon Levels	0.0%	33.6%	24.1%	32.8%	8.4%	25.1%
Tested Units Needing More Work	0.0%	0.0%	0.0%	14.1%	0.0%	0.7%
Units With Slabs						
Tested For Radon Levels	0.0%	1.5%	9.9%	5.0%	0.0%	3.1%
Tested Units Needing More Work	0.0%	0.0%	0.0%	88.6%	0.0%	26.8%
CONSTRUCTION METHOD						
DWELLINGS WITH RADON REDUCING FEATURES						
Conventional Constructed On Site						
With radon reducing features	19.5%	21.4%	21.3%	24.7%	49.7%	26.5%
No radon reducing features	80.5%	78.6%	78.7%	75.3%	50.3%	73.5%
Prefabricated Units (Panelized)						
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Modular						
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ALL Dwellings						
With radon reducing features	19.5%	21.4%	21.3%	24.7%	49.7%	26.5%
No radon reducing features	80.5%	78.6%	78.7%	75.3%	50.3%	73.5%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SIZE OF BUILDER						
DWELLINGS WITH RADON REDUCING FEATURES						
One to Ten Dwellings Per Year						
With radon reducing features	11.4%	9.0%	18.6%	13.9%	13.8%	13.2%
No radon reducing features	32.4%	52.0%	63.7%	32.9%	35.9%	43.9%
Eleven To Twenty-Five Dwellings Per Year						
With radon reducing features	6.0%	12.4%	0.8%	4.4%	32.0%	10.4%
No radon reducing features	16.2%	5.7%	6.9%	1.9%	5.2%	6.8%
Twenty-Six To 100 Dwellings Per Year						
With radon reducing features	2.2%	0.0%	2.0%	3.9%	3.9%	2.3%
No radon reducing features	31.9%	6.8%	8.1%	30.0%	9.2%	17.1%
Over 100 Dwellings Per Year						
With radon reducing features	0.0%	0.0%	0.0%	2.6%	0.0%	0.6%
No radon reducing features	0.0%	14.1%	0.0%	10.4%	0.0%	5.7%

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METHODS EMPLOYED TO REDUCE RADON						
Dwellings With Basements						
Rough-in for subslab ventilation	16.8%	6.0%	18.7%	27.5%	12.1%	16.3%
Passive stack subslab ventilation	13.0%	7.5%	15.5%	22.8%	29.3%	17.1%
Fan-driven subslab depressurization	2.7%	0.6%	2.0%	1.8%	17.6%	4.3%
Only sealed entry routes	11.9%	25.6%	15.9%	19.1%	29.3%	20.4%
None	48.1%	19.5%	25.7%	21.4%	4.4%	23.6%
SUBTOTAL -- BASEMENTS	92.5%	59.1%	77.7%	92.5%	92.8%	81.8%
Dwellings With Crawl Spaces						
Passive stack subslab ventilation	3.8%	12.8%	3.4%	0.0%	1.6%	4.6%
Fan-driven (active) ventilation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Foundation Wall Vents	0.0%	1.7%	5.9%	0.5%	0.0%	1.7%
None	3.2%	7.6%	8.7%	1.3%	3.1%	4.9%
SUBTOTAL -- CRAWL SPACES	7.0%	22.0%	18.0%	1.9%	4.7%	11.1%
Dwellings With Slabs						
Rough-in for subslab ventilation	0.5%	0.0%	0.9%	0.8%	0.3%	0.5%
Passive stack subslab ventilation	0.0%	0.6%	0.4%	0.2%	1.0%	0.4%
Fan-driven subslab depressurization	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%
Only sealed entry routes	0.0%	10.5%	1.7%	2.1%	0.6%	3.4%
None	0.0%	7.7%	1.3%	2.6%	0.5%	2.8%
SUBTOTAL -- SLABS	0.5%	18.8%	4.3%	5.7%	2.6%	7.1%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS						
(Multiple Answers Possible)						
Dwellings With Basements						
Polyethylene/other membrn under slab	30.4%	47.2%	50.6%	47.6%	88.5%	51.9%
Membrane on frndtn. walls	1.8%	27.1%	6.6%	5.5%	20.6%	12.6%
Caulk around slab, wall oprgs. & joints	6.4%	10.5%	35.3%	33.1%	43.1%	25.3%
Seal interior of foundation walls	5.3%	9.6%	19.6%	18.4%	1.6%	11.5%
Locate sump access outside of bsmt.	0.0%	4.8%	0.0%	0.0%	0.0%	1.1%
Install air tight sump pit covers	8.8%	14.7%	43.0%	19.7%	56.9%	27.4%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
None	65.5%	40.4%	37.4%	31.0%	7.5%	36.5%
TOTAL (may exceed 100%)	118.1%	154.2%	192.5%	155.3%	218.2%	166.4%
SEALING METHODS -- SLABS						
(Multiple Answers Possible)						
Dwellings With Slabs						
Polyethylene/other membrn under slab	100.0%	59.0%	29.6%	54.3%	57.3%	58.9%
Membrane on frndtn. walls	0.0%	37.9%	39.3%	14.3%	19.6%	23.2%
Caulk around slab, wall oprgs. & joints	0.0%	15.0%	9.9%	3.3%	3.3%	6.8%
Seal interior of foundation walls	0.0%	0.0%	0.0%	3.3%	0.0%	0.8%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Install air tight sump pit covers	100.0%	40.9%	9.9%	0.0%	19.6%	32.0%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
None	0.0%	41.1%	31.1%	45.8%	39.4%	32.8%
TOTAL (may exceed 100%)	200.0%	193.9%	119.8%	121.0%	139.2%	154.5%

	IL	IN	MI	OH	WI	E N CEN
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)						
Dwellings On Basements And Slabs						
Crushed aggregate 4" or more deep	83.2%	71.7%	77.3%	80.2%	73.2%	77.0%
Crushed aggregate less than 4" deep	15.7%	8.7%	3.1%	5.8%	7.4%	7.9%
Sand	22.1%	23.9%	30.0%	2.3%	9.5%	17.4%
Strips of geotextile drainage mat	9.9%	3.6%	0.0%	6.4%	0.0%	4.0%
Sheets of rigid foam insulation	16.9%	37.7%	48.6%	27.3%	29.8%	32.6%
Perforated plastic pipe	47.7%	50.0%	36.2%	40.5%	17.1%	39.2%
Plastic sheet (vapor barrier)	65.7%	76.1%	59.7%	52.2%	69.8%	64.5%
Other	1.2%	3.6%	0.0%	0.0%	4.2%	1.7%
None	1.7%	17.4%	10.1%	12.5%	12.9%	11.4%
TOTAL (may exceed 100%)	263.9%	292.8%	264.9%	227.2%	224.1%	255.8%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)						
Dwellings On Basements						
Crushed aggregate 4" or more deep	83.1%	64.7%	80.4%	82.1%	73.6%	76.4%
Crushed aggregate less than 4" deep	15.8%	11.5%	3.3%	4.0%	7.2%	8.1%
Sand	22.2%	18.5%	27.3%	1.0%	9.2%	15.3%
Strips of geotextile drainage mat	9.9%	4.8%	0.0%	6.8%	0.0%	4.4%
Sheets of rigid foam insulation	17.0%	27.1%	46.9%	22.8%	28.4%	28.5%
Perforated plastic pipe	47.4%	51.9%	36.0%	37.4%	16.4%	38.8%
Plastic sheet (vapor barrier)	65.5%	68.5%	61.8%	51.5%	69.5%	62.9%
Other	1.2%	4.8%	0.0%	0.0%	4.3%	2.0%
None	1.2%	22.9%	10.1%	12.4%	11.7%	12.4%
TOTAL (may exceed 100%)	263.1%	274.6%	265.8%	217.9%	220.3%	248.9%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)						
Dwellings On Slabs						
Crushed aggregate 4" or more deep	100.0%	94.0%	21.4%	49.1%	59.3%	64.6%
Crushed aggregate less than 4" deep	0.0%	0.0%	0.0%	36.6%	17.8%	11.4%
Sand	0.0%	40.9%	78.6%	23.5%	19.6%	33.8%
Strips of geotextile drainage mat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sheets of rigid foam insulation	0.0%	71.0%	78.6%	100.0%	80.2%	68.4%
Perforated plastic pipe	100.0%	43.9%	39.3%	90.9%	42.7%	63.3%
Plastic sheet (vapor barrier)	100.0%	100.0%	21.4%	63.4%	80.4%	72.8%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
None	100.0%	0.0%	9.9%	14.3%	59.3%	32.3%
TOTAL (may exceed 100%)	400.0%	349.8%	249.2%	377.7%	359.3%	346.5%

	IL	IN	MI	OH	WI	E N CEN
COST OF PASSIVE SUB-SLAB VENTILATION						
Sample Size	19	13	15	13	20	80
Dwellings						
Less than \$200	23.0%	50.0%	37.9%	38.5%	14.1%	33.1%
\$200 to \$299	41.9%	21.9%	31.8%	43.9%	24.4%	32.1%
\$300 to \$399	4.7%	12.5%	22.7%	0.8%	36.3%	16.1%
\$400 to \$499	2.0%	15.6%	0.0%	15.4%	19.3%	12.0%
\$500 to \$599	0.0%	0.0%	0.0%	1.5%	3.7%	1.2%
\$600 to \$799	0.0%	0.0%	7.6%	0.0%	0.0%	1.3%
\$800 or greater	28.4%	0.0%	0.0%	0.0%	2.2%	4.2%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
COST OF ACTIVE SUB-SLAB VENTILATION						
Sample Size	7	5	6	4	13	35
Dwellings						
Less than \$450	0.0%	21.1%	14.7%	0.0%	23.9%	18.2%
\$450 to \$549	19.5%	0.0%	0.0%	23.1%	5.4%	7.9%
\$550 to \$649	12.6%	15.8%	61.8%	0.0%	3.3%	9.7%
\$650 to \$749	0.0%	5.3%	0.0%	38.5%	22.8%	19.2%
\$750 to \$849	28.7%	57.9%	2.9%	19.2%	30.4%	27.5%
\$850 to \$1049	37.9%	0.0%	20.6%	0.0%	14.1%	15.5%
\$1050 or greater	1.2%	0.0%	0.0%	19.2%	0.0%	1.9%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

	IA & NE	KS & MO	MN	ND & SD	W N CEN
SAMPLE SIZE					
Units	280	177	155	141	753
Builders	41	42	51	37	171
WGHTD AVERAGE UNITS PER BLDR	6.8	4.2	3.0	3.8	4.7
TYPE OF HOUSE: WITH RADON REDUCING FEATURES					
One Story Dwellings With Basements					
With radon reducing features	24.8%	14.7%	32.2%	29.3%	23.8%
No radon reducing features	50.0%	47.9%	8.4%	50.8%	40.4%
One story Dwellings With Crawl Spaces					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	6.9%	0.0%	5.8%	3.0%
One Story Dwellings On Slabs					
With radon reducing features	0.0%	0.0%	3.3%	1.2%	0.9%
No radon reducing features	0.0%	3.6%	0.0%	2.1%	1.5%
Two Story Dwellings With Basements					
With radon reducing features	10.9%	2.1%	47.3%	0.2%	14.4%
No radon reducing features	14.3%	22.9%	1.8%	10.4%	13.8%
Two Story Dwellings With Crawl Spaces					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	1.3%	0.0%	0.3%
Two Story Dwellings On Slabs					
With radon reducing features	0.0%	0.0%	3.5%	0.2%	0.8%
No radon reducing features	0.0%	0.3%	0.3%	0.0%	0.2%
Three Story Dwellings With Basements					
With radon reducing features	0.0%	0.0%	1.7%	0.0%	0.4%
No radon reducing features	0.0%	0.0%	0.2%	0.0%	0.0%
Three Story Dwellings With Crawl Spaces					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
Three Story Dwellings On Slabs					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
Houses on piers	0.0%	1.6%	0.0%	0.0%	0.5%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS					
Basements					
With radon reducing features	35.7%	17.1%	81.2%	29.5%	38.7%
No radon reducing features	64.3%	72.0%	10.4%	61.2%	54.6%
Crawl Spaces					
With radon reducing features	0.0%	0.0%	0.0%	0.1%	0.0%
No radon reducing features	0.0%	7.0%	1.3%	5.8%	3.4%
Slabs on Grade					
With radon reducing features	0.0%	0.0%	6.8%	1.4%	1.7%
No radon reducing features	0.0%	4.0%	0.3%	2.1%	1.7%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS					
With radon reducing features	35.7%	17.1%	88.0%	31.0%	40.4%
No radon reducing features	64.3%	83.0%	12.0%	69.1%	59.6%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%

	IA & NE	KS & MO	MN	ND & SD	W N CEN
TESTING OF DWELLINGS					
All Units					
Tested For Radon Levels	34.4%	19.1%	19.3%	26.5%	25.0%
Tested Units Needing More Work	26.1%	15.6%	4.9%	65.6%	26.1%
Units With Basements					
Tested For Radon Levels	34.4%	21.0%	17.2%	26.5%	25.5%
Tested Units Needing More Work	26.1%	15.7%	6.1%	72.5%	27.5%
Units With Crawl Spaces					
Tested For Radon Levels	0.0%	0.8%	100.0%	5.5%	10.4%
Tested Units Needing More Work	0.0%	10.0%	0.0%	0.0%	0.5%
Units With Slabs					
Tested For Radon Levels	0.0%	9.0%	31.8%	63.2%	27.8%
Tested Units Needing More Work	0.0%	10.0%	0.0%	0.0%	1.2%
CONSTRUCTION METHOD					
DWELLINGS WITH RADON REDUCING FEATURES					
Conventional Constructed On Site					
With radon reducing features	35.7%	17.1%	88.0%	31.0%	40.4%
No radon reducing features	64.3%	83.0%	12.0%	69.1%	59.6%
Prefabricated Units (Panelized)					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
Modular					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
ALL Dwellings					
With radon reducing features	35.7%	17.1%	88.0%	31.0%	40.4%
No radon reducing features	64.3%	83.0%	12.0%	69.1%	59.6%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%
SIZE OF BUILDER					
DWELLINGS WITH RADON REDUCING FEATURES					
One to Ten Dwellings Per Year					
With radon reducing features	13.8%	2.9%	58.3%	31.0%	22.5%
No radon reducing features	20.5%	67.6%	12.0%	52.0%	38.4%
Eleven To Twenty-Five Dwellings Per Year					
With radon reducing features	5.4%	14.1%	0.0%	0.0%	6.2%
No radon reducing features	17.4%	5.2%	0.0%	17.0%	9.6%
Twenty-Six To 100 Dwellings Per Year					
With radon reducing features	16.4%	0.0%	14.2%	0.0%	8.3%
No radon reducing features	26.4%	10.2%	0.0%	0.0%	11.6%
Over 100 Dwellings Per Year					
With radon reducing features	0.0%	0.0%	15.5%	0.0%	3.4%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%

	IA & NE	KS & MO	MN	ND & SD	W N CEN
METHODS EMPLOYED TO REDUCE RADON					
Dwellings With Basements					
Rough-in for subslab ventilation	39.8%	12.7%	3.9%	19.2%	20.3%
Passive stack subslab ventilation	29.0%	15.9%	75.8%	29.2%	35.0%
Fan-driven subslab depressurization	6.7%	1.1%	5.4%	0.3%	3.7%
Only sealed entry routes	3.9%	30.1%	2.6%	25.0%	15.1%
None	20.7%	29.1%	3.9%	17.0%	19.2%
SUBTOTAL -- BASEMENTS	100.0%	89.0%	91.6%	90.7%	93.3%
Dwellings With Crawl Spaces					
Passive stack subslab ventilation	0.0%	0.0%	0.0%	0.1%	0.0%
Fan-driven (active) ventilation	0.0%	0.0%	0.0%	0.0%	0.0%
Foundation Wall Vents	0.0%	0.0%	0.0%	0.0%	0.0%
None	0.0%	7.0%	1.3%	5.8%	3.4%
SUBTOTAL -- CRAWL SPACES	0.0%	7.0%	1.3%	5.9%	3.4%
Dwellings With Slabs					
Rough-in for subslab ventilation	0.0%	0.6%	0.0%	1.4%	0.4%
Passive stack subslab ventilation	0.0%	0.0%	6.8%	1.4%	1.7%
Fan-driven subslab depressurization	0.0%	0.0%	0.0%	0.0%	0.0%
Only sealed entry routes	0.0%	2.9%	0.3%	0.0%	1.0%
None	0.0%	0.6%	0.0%	0.7%	0.3%
SUBTOTAL -- SLABS	0.0%	4.0%	7.1%	3.5%	3.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS					
(Multiple Answers Possible)					
Dwellings With Basements					
Polyethylene/other membrn under slab	57.5%	45.0%	68.3%	68.7%	57.5%
Membrane on frndtn. walls	27.9%	7.0%	27.5%	7.3%	18.1%
Caulk around slab, wall opngs. & joints	4.6%	10.6%	67.6%	6.1%	20.4%
Seal interior of foundation walls	0.4%	1.3%	46.5%	5.3%	11.4%
Locate sump access outside of bsmt.	0.0%	0.0%	1.4%	1.9%	0.6%
Install air tight sump pit covers	23.2%	15.9%	54.9%	10.0%	25.8%
Other	0.4%	0.0%	0.0%	0.8%	0.2%
None	39.3%	43.1%	8.5%	21.1%	31.2%
TOTAL (may exceed 100%)	153.2%	122.8%	274.7%	121.3%	165.2%
SEALING METHODS -- SLABS					
(Multiple Answers Possible)					
Dwellings With Slabs					
Polyethylene/other membrn under slab	0.0%	56.1%	72.7%	59.2%	42.4%
Membrane on frndtn. walls	0.0%	0.0%	18.2%	30.7%	8.4%
Caulk around slab, wall opngs. & joints	0.0%	29.9%	45.5%	18.3%	22.1%
Seal interior of foundation walls	0.0%	0.0%	9.1%	18.3%	4.6%
Locate sump access outside of bsmt.	0.0%	0.0%	9.1%	10.3%	3.5%
Install air tight sump pit covers	0.0%	0.0%	63.6%	38.7%	19.5%
Other	0.0%	0.0%	0.0%	0.0%	0.0%
None	0.0%	14.0%	0.0%	20.4%	7.5%
TOTAL (may exceed 100%)	0.0%	100.0%	218.2%	196.0%	108.0%

	IA & NE	KS & MO	MN	ND & SD	W N CEN
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)					
Dwellings On Basements And Slabs					
Crushed aggregate 4" or more deep	75.0%	90.3%	92.2%	87.3%	85.4%
Crushed aggregate less than 4" deep	7.1%	0.6%	3.9%	3.0%	3.7%
Sand	12.9%	4.9%	49.7%	12.8%	18.3%
Strips of geotextile drainage mat	4.3%	0.0%	3.3%	0.0%	2.1%
Sheets of rigid foam insulation	12.1%	17.0%	58.8%	7.5%	23.2%
Perforated plastic pipe	65.7%	43.0%	51.0%	63.3%	54.9%
Plastic sheet (vapor barrier)	78.6%	70.3%	81.1%	71.5%	75.4%
Other	8.6%	0.0%	19.0%	2.3%	7.2%
None	12.1%	11.5%	7.2%	6.2%	10.0%
TOTAL (may exceed 100%)	276.4%	237.5%	366.0%	253.9%	280.1%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)					
Dwellings On Basements					
Crushed aggregate 4" or more deep	75.0%	89.9%	92.3%	87.2%	85.3%
Crushed aggregate less than 4" deep	7.1%	0.6%	4.2%	3.1%	3.8%
Sand	12.9%	5.1%	52.1%	11.7%	18.7%
Strips of geotextile drainage mat	4.3%	0.0%	2.8%	0.0%	2.0%
Sheets of rigid foam insulation	12.1%	17.8%	57.0%	5.5%	22.7%
Perforated plastic pipe	65.7%	43.6%	49.3%	62.6%	54.6%
Plastic sheet (vapor barrier)	78.6%	69.6%	80.3%	72.3%	75.1%
Other	8.6%	0.0%	19.7%	0.8%	7.1%
None	12.1%	12.1%	7.8%	5.8%	10.2%
TOTAL (may exceed 100%)	276.4%	238.5%	365.5%	249.0%	279.6%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)					
Dwellings On Slabs					
Crushed aggregate 4" or more deep	0.0%	100.0%	90.9%	89.7%	64.9%
Crushed aggregate less than 4" deep	0.0%	0.0%	0.0%	0.0%	0.0%
Sand	0.0%	0.0%	18.2%	40.8%	9.9%
Strips of geotextile drainage mat	0.0%	0.0%	9.1%	0.0%	2.0%
Sheets of rigid foam insulation	0.0%	0.0%	81.8%	61.3%	26.7%
Perforated plastic pipe	0.0%	29.9%	72.7%	81.7%	37.3%
Plastic sheet (vapor barrier)	0.0%	86.0%	90.9%	48.8%	54.5%
Other	0.0%	0.0%	9.1%	40.8%	7.9%
None	0.0%	0.0%	0.0%	18.3%	2.7%
TOTAL (may exceed 100%)	0.0%	215.9%	372.7%	381.5%	205.8%

	IA & NE	KS & MO	MN	ND & SD	W N CEN
COST OF PASSIVE SUB-SLAB VENTILATION					
Sample Size	20	15	44	13	92
Dwellings					
Less than \$200	58.6%	58.6%	6.2%	3.9%	26.3%
\$200 to \$299	10.5%	24.3%	40.0%	74.5%	34.6%
\$300 to \$399	26.8%	1.4%	11.0%	0.0%	12.3%
\$400 to \$499	0.0%	0.0%	12.4%	9.8%	7.3%
\$500 to \$599	1.8%	12.9%	19.3%	7.8%	12.6%
\$600 to \$799	0.0%	2.9%	1.4%	3.9%	1.6%
\$800 or greater	2.3%	0.0%	9.7%	0.0%	5.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
 COST OF ACTIVE SUB-SLAB VENTILATION					
Sample Size	12	9	16	3	40
Dwellings					
Less than \$450	30.0%	21.7%	7.8%	0.0%	21.8%
\$450 to \$549	29.2%	1.7%	2.0%	57.1%	18.1%
\$550 to \$649	3.3%	15.0%	19.6%	0.0%	9.6%
\$650 to \$749	4.2%	23.3%	7.8%	0.0%	7.2%
\$750 to \$849	1.7%	35.0%	0.0%	14.3%	4.6%
\$850 to \$1049	31.7%	3.3%	15.7%	28.6%	23.8%
\$1050 or greater	0.0%	0.0%	47.1%	0.0%	15.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

	DE & MD	NO FL	SO FL	GA	NC & SC	VA & WV	S ATL
SAMPLE SIZE							
Units	355	274	72	146	225	222	1294
Builders	38	50	28	43	62	40	261
WGHTD AVERAGE UNITS PER BLDR	9.3	5.5	2.6	3.4	3.6	5.5	4.7
TYPE OF HOUSE: WITH RADON REDUCING FEATURES							
One Story Dwellings With Basements							
With radon reducing features	2.8%	0.0%	0.0%	3.0%	0.9%	0.5%	1.0%
No radon reducing features	8.1%	0.3%	1.6%	16.8%	3.2%	24.9%	8.1%
One story Dwellings With Crawl Spaces							
With radon reducing features	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.7%
No radon reducing features	7.9%	0.5%	0.7%	4.4%	17.6%	7.0%	8.5%
One Story Dwellings On Slabs							
With radon reducing features	0.3%	0.0%	7.8%	2.1%	3.3%	0.0%	2.2%
No radon reducing features	3.8%	73.7%	55.8%	14.6%	12.8%	0.3%	25.6%
Two Story Dwellings With Basements							
With radon reducing features	50.6%	0.0%	0.0%	3.8%	4.4%	16.5%	9.5%
No radon reducing features	20.0%	1.1%	5.8%	30.1%	2.0%	26.8%	11.4%
Two Story Dwellings With Crawl Spaces							
With radon reducing features	0.0%	0.0%	0.0%	0.0%	3.6%	0.5%	1.3%
No radon reducing features	3.4%	0.2%	0.4%	6.6%	20.2%	9.7%	9.5%
Two Story Dwellings On Slabs							
With radon reducing features	0.0%	0.0%	0.0%	0.4%	0.4%	1.4%	0.4%
No radon reducing features	1.2%	21.6%	20.0%	15.7%	26.1%	5.7%	17.7%
Three Story Dwellings With Basements							
With radon reducing features	1.4%	0.0%	0.0%	1.4%	0.9%	0.9%	0.7%
No radon reducing features	0.0%	0.0%	0.0%	1.2%	0.9%	5.0%	1.2%
Three Story Dwellings With Crawl Spaces							
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.2%	0.0%	0.0%	0.0%	0.0%	0.9%	0.2%
Three Story Dwellings On Slabs							
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.4%	1.3%	0.0%	0.0%	0.0%	0.2%
Houses on piers	0.3%	2.2%	6.6%	0.0%	1.5%	0.0%	1.6%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS							
Basements							
With radon reducing features	55.0%	0.0%	0.0%	8.2%	6.2%	17.8%	11.3%
No radon reducing features	28.2%	1.4%	7.9%	48.1%	6.2%	56.7%	20.8%
Crawl Spaces							
With radon reducing features	0.0%	0.0%	0.0%	0.0%	5.9%	0.5%	2.0%
No radon reducing features	11.5%	0.7%	1.2%	11.0%	38.4%	17.6%	18.4%
Slabs on Grade							
With radon reducing features	0.3%	0.0%	8.3%	2.5%	3.8%	1.4%	2.7%
No radon reducing features	5.0%	97.8%	82.6%	30.3%	39.5%	6.1%	44.8%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS							
With radon reducing features	55.2%	0.0%	8.3%	10.7%	15.9%	19.6%	16.1%
No radon reducing features	44.8%	100.0%	91.7%	89.3%	84.1%	80.4%	83.9%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

	DE & MD	NO FL	SO FL	GA	NC & SC	VA & WV	S ATL
TESTING OF DWELLINGS							
All Units							
Tested For Radon Levels	7.7%	2.9%	7.0%	12.7%	10.5%	3.7%	7.7%
Tested Units Needing More Work	6.6%	0.0%	0.0%	15.1%	10.7%	7.6%	9.3%
Units With Basements							
Tested For Radon Levels	8.7%	0.0%	0.0%	17.1%	34.8%	3.6%	11.8%
Tested Units Needing More Work	7.0%	0.0%	0.0%	15.0%	7.0%	10.3%	9.9%
Units With Crawl Spaces							
Tested For Radon Levels	1.0%	0.0%	0.0%	1.3%	7.0%	1.8%	5.4%
Tested Units Needing More Work	0.0%	0.0%	0.0%	50.0%	8.0%	0.0%	8.3%
Units With Slabs							
Tested For Radon Levels	7.1%	3.0%	7.7%	9.1%	7.2%	9.1%	5.9%
Tested Units Needing More Work	0.0%	0.0%	0.0%	13.9%	18.6%	0.0%	8.8%
CONSTRUCTION METHOD							
DWELLINGS WITH RADON REDUCING FEATURES							
Conventional Constructed On Site							
With radon reducing features	55.2%	0.0%	8.3%	10.7%	15.9%	19.6%	16.1%
No radon reducing features	44.8%	100.0%	91.7%	89.3%	84.1%	80.4%	83.9%
Prefabricated Units (Panelized)							
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Modular							
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ALL Dwellings							
With radon reducing features	55.2%	0.0%	8.3%	10.7%	15.9%	19.6%	16.1%
No radon reducing features	44.8%	100.0%	91.7%	89.3%	84.1%	80.4%	83.9%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SIZE OF BUILDER							
DWELLINGS WITH RADON REDUCING FEATURES							
One to Ten Dwellings Per Year							
With radon reducing features	4.8%	0.0%	8.3%	10.1%	15.9%	6.5%	9.0%
No radon reducing features	15.8%	31.7%	47.3%	46.8%	46.5%	45.7%	40.8%
Eleven To Twenty-Five Dwellings Per Year							
With radon reducing features	13.2%	0.0%	0.0%	0.6%	0.0%	0.0%	1.4%
No radon reducing features	11.3%	25.6%	44.4%	30.2%	0.0%	8.1%	15.5%
Twenty-Six To 100 Dwellings Per Year							
With radon reducing features	11.8%	0.0%	0.0%	0.0%	0.0%	13.1%	3.2%
No radon reducing features	16.6%	29.2%	0.0%	12.3%	11.1%	13.1%	14.1%
Over 100 Dwellings Per Year							
With radon reducing features	25.4%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%
No radon reducing features	1.1%	13.5%	0.0%	0.0%	26.6%	13.5%	13.5%

	DE & MD	NO FL	SO FL	GA	NC & SC	VA & WV	S ATL
METHODS EMPLOYED TO REDUCE RADON							
Dwellings With Basements							
Rough-in for subslab ventilation	17.5%	0.0%	5.6%	7.5%	1.8%	14.8%	6.2%
Passive stack subslab ventilation	53.3%	0.0%	0.0%	2.7%	4.9%	17.6%	10.0%
Fan-driven subslab depressurization	1.7%	0.0%	0.0%	5.5%	1.3%	0.2%	1.3%
Only sealed entry routes	4.7%	0.2%	1.8%	26.1%	2.4%	24.1%	8.5%
None	6.1%	1.3%	0.5%	14.5%	2.1%	17.8%	6.1%
SUBTOTAL -- BASEMENTS	83.2%	1.4%	7.9%	56.3%	12.4%	74.5%	32.1%
Dwellings With Crawl Spaces							
Passive stack subslab ventilation	0.0%	0.0%	0.0%	0.0%	5.9%	0.5%	2.0%
Fan-driven (active) ventilation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Foundation Wall Vents	0.0%	0.2%	0.2%	1.6%	3.9%	4.5%	2.2%
None	11.5%	0.6%	1.0%	9.4%	34.5%	13.1%	16.1%
SUBTOTAL -- CRAWL SPACES	11.5%	0.7%	1.2%	11.0%	44.3%	18.1%	20.4%
Dwellings With Slabs							
Rough-in for subslab ventilation	0.0%	0.0%	0.0%	3.7%	0.0%	0.0%	0.5%
Passive stack subslab ventilation	0.3%	0.0%	8.3%	0.4%	3.8%	1.4%	2.5%
Fan-driven subslab depressurization	0.0%	0.0%	0.0%	2.1%	0.0%	0.0%	0.3%
Only sealed entry routes	4.1%	62.1%	54.9%	10.2%	23.9%	2.7%	27.1%
None	0.9%	35.8%	27.7%	16.4%	15.6%	3.4%	17.2%
SUBTOTAL -- SLABS	5.3%	97.8%	90.9%	32.7%	43.3%	7.4%	47.5%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS (Multiple Answers Possible)							
Dwellings With Basements							
Polyethylene/other membrn under slab	63.5%	12.7%	93.3%	63.4%	54.9%	37.5%	50.9%
Membrane on frndtn. walls	1.4%	0.0%	0.0%	14.6%	3.6%	1.2%	3.3%
Caulk around slab, wall opngs. & joints	47.8%	0.0%	0.0%	32.8%	10.7%	12.1%	14.3%
Seal interior of foundation walls	13.6%	0.0%	0.0%	30.4%	21.4%	1.2%	12.5%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	11.0%	0.0%	0.0%	1.4%
Install air tight sump pit covers	27.5%	0.0%	0.0%	12.2%	0.0%	38.1%	10.2%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
None	17.8%	87.3%	6.7%	25.7%	45.1%	26.2%	40.3%
TOTAL (may exceed 100%)	171.5%	100.0%	100.0%	190.0%	135.6%	116.3%	132.9%
SEALING METHODS -- SLABS (Multiple Answers Possible)							
Dwellings With Slabs							
Polyethylene/other membrn under slab	77.0%	52.3%	65.0%	29.1%	59.9%	54.5%	56.1%
Membrane on frndtn. walls	0.0%	11.6%	10.7%	0.0%	9.2%	0.0%	6.3%
Caulk around slab, wall opngs. & joints	5.3%	3.4%	3.1%	31.4%	2.6%	0.0%	6.3%
Seal interior of foundation walls	0.0%	0.4%	3.1%	10.5%	4.1%	0.0%	3.1%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.3%
Install air tight sump pit covers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
None	17.7%	36.6%	30.4%	50.0%	36.0%	45.5%	36.9%
TOTAL (may exceed 100%)	100.0%	104.1%	112.2%	120.9%	112.8%	100.0%	109.0%

	DE & MD	NO FL	SO FL	GA	NC & SC	VA & WV	S ATL
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)							
Dwellings On Basements And Slabs							
Crushed aggregate 4" or more deep	96.8%	2.2%	18.3%	67.7%	49.2%	69.2%	47.7%
Crushed aggregate less than 4" deep	1.4%	0.0%	0.0%	11.5%	1.6%	20.9%	5.4%
Sand	1.3%	60.0%	66.6%	13.1%	50.2%	6.1%	37.3%
Strips of geotextile drainage mat	0.6%	0.4%	0.0%	10.0%	0.0%	0.5%	1.5%
Sheets of rigid foam insulation	85.7%	0.0%	0.0%	3.1%	20.7%	54.4%	24.2%
Perforated plastic pipe	64.0%	0.0%	8.5%	26.9%	26.6%	21.9%	22.9%
Plastic sheet (vapor barrier)	85.7%	84.7%	63.0%	82.8%	90.7%	58.8%	80.2%
Other	16.7%	12.5%	0.0%	11.5%	4.8%	0.0%	6.9%
None	2.2%	3.7%	8.1%	4.6%	8.6%	3.5%	5.7%
TOTAL (may exceed 100%)	354.4%	163.4%	164.4%	231.3%	252.2%	235.2%	231.8%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)							
Dwellings On Basements							
Crushed aggregate 4" or more deep	97.6%	0.0%	70.8%	74.5%	76.3%	73.4%	63.6%
Crushed aggregate less than 4" deep	1.1%	0.0%	0.0%	18.3%	7.1%	23.0%	8.4%
Sand	0.0%	50.9%	17.7%	0.0%	7.1%	1.8%	13.6%
Strips of geotextile drainage mat	0.7%	0.0%	0.0%	15.8%	0.0%	0.2%	2.1%
Sheets of rigid foam insulation	86.6%	0.0%	0.0%	4.9%	17.8%	49.8%	22.9%
Perforated plastic pipe	68.1%	0.0%	0.0%	31.8%	19.3%	23.2%	20.8%
Plastic sheet (vapor barrier)	86.2%	87.3%	88.5%	82.0%	76.3%	54.7%	77.9%
Other	17.5%	0.0%	0.0%	18.3%	14.3%	0.0%	8.8%
None	1.9%	100.0%	29.2%	3.7%	23.7%	3.9%	30.0%
TOTAL (may exceed 100%)	359.8%	238.2%	206.2%	249.1%	241.9%	229.9%	248.1%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)							
Dwellings On Slabs							
Crushed aggregate 4" or more deep	84.0%	2.2%	13.8%	56.0%	41.5%	27.3%	35.4%
Crushed aggregate less than 4" deep	6.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Sand	21.2%	60.1%	70.8%	35.6%	62.6%	48.5%	53.4%
Strips of geotextile drainage mat	0.0%	0.4%	0.0%	0.0%	0.0%	3.1%	0.5%
Sheets of rigid foam insulation	71.7%	0.0%	0.0%	0.0%	21.5%	100.0%	29.8%
Perforated plastic pipe	0.0%	0.0%	9.2%	18.6%	28.6%	9.1%	14.3%
Plastic sheet (vapor barrier)	77.0%	84.7%	60.8%	84.2%	94.8%	100.0%	87.0%
Other	4.4%	12.7%	0.0%	0.0%	2.1%	0.0%	3.4%
None	6.2%	2.2%	6.3%	6.3%	4.2%	0.0%	3.9%
TOTAL (may exceed 100%)	270.8%	162.3%	160.8%	200.7%	255.2%	287.9%	228.3%

	DE & MD	NO FL	SO FL	GA	NC & SC	VA & WV	S ATL
COST OF PASSIVE SUB-SLAB VENTILATION							
Sample Size	14	5	6	15	18	12	70
Dwellings							
Less than \$200	26.9%	100.0%	83.3%	64.8%	47.5%	24.7%	37.9%
\$200 to \$299	17.9%	0.0%	0.0%	1.9%	22.0%	63.9%	27.3%
\$300 to \$399	24.9%	0.0%	8.3%	5.6%	13.6%	5.2%	15.4%
\$400 to \$499	6.5%	0.0%	0.0%	11.1%	3.4%	1.0%	4.0%
\$500 to \$599	22.4%	0.0%	0.0%	13.0%	11.9%	0.0%	12.5%
\$600 to \$799	0.0%	0.0%	8.3%	0.0%	1.7%	0.0%	1.1%
\$800 or greater	1.5%	0.0%	0.0%	3.7%	0.0%	5.2%	1.7%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
COST OF ACTIVE SUB-SLAB VENTILATION							
Sample Size	3	3	2	9	6	6	29
Dwellings							
Less than \$450	85.7%	100.0%	50.0%	25.7%	64.3%	51.9%	43.4%
\$450 to \$549	2.0%	0.0%	50.0%	5.7%	14.3%	3.7%	7.7%
\$550 to \$649	12.2%	0.0%	0.0%	20.0%	7.1%	0.0%	15.2%
\$650 to \$749	0.0%	0.0%	0.0%	17.1%	0.0%	0.0%	10.2%
\$750 to \$849	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
\$850 to \$1049	0.0%	0.0%	0.0%	0.0%	0.0%	7.4%	0.2%
\$1050 or greater	0.0%	0.0%	0.0%	31.4%	14.3%	37.0%	23.5%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

	AL & MS	KY & TN	E S CEN
SAMPLE SIZE			
Units	297	284	581
Builders	46	52	98
WGHTD AVERAGE UNITS PER BLDR	6.5	5.5	5.9
TYPE OF HOUSE: WITH RADON REDUCING FEATURES			
One Story Dwellings With Basements			
With radon reducing features	0.2%	9.8%	5.5%
No radon reducing features	2.7%	7.9%	5.6%
One story Dwellings With Crawl Spaces			
With radon reducing features	0.6%	2.4%	1.6%
No radon reducing features	33.6%	18.1%	25.0%
One Story Dwellings On Slabs			
With radon reducing features	5.2%	3.4%	4.2%
No radon reducing features	42.7%	11.6%	25.3%
Two Story Dwellings With Basements			
With radon reducing features	1.7%	9.3%	6.0%
No radon reducing features	1.7%	5.0%	3.5%
Two Story Dwellings With Crawl Spaces			
With radon reducing features	0.3%	5.4%	3.1%
No radon reducing features	1.2%	13.1%	7.8%
Two Story Dwellings On Slabs			
With radon reducing features	1.3%	5.2%	3.5%
No radon reducing features	6.9%	8.5%	7.8%
Three Story Dwellings With Basements			
With radon reducing features	0.0%	0.4%	0.2%
No radon reducing features	0.0%	0.0%	0.0%
Three Story Dwellings With Crawl Spaces			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%
Three Story Dwellings On Slabs			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.3%	0.0%	0.1%
Houses on piers	1.7%	0.0%	0.8%
TOTAL	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS			
Basements			
With radon reducing features	1.9%	19.5%	11.7%
No radon reducing features	4.4%	12.9%	9.1%
Crawl Spaces			
With radon reducing features	0.9%	7.7%	4.7%
No radon reducing features	35.4%	31.2%	33.1%
Slabs on Grade			
With radon reducing features	6.7%	8.6%	7.8%
No radon reducing features	50.8%	20.1%	33.7%
TOTAL	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS			
With radon reducing features	9.4%	35.8%	24.2%
No radon reducing features	90.6%	64.2%	75.8%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%

	AL & MS	KY & TN	E S CEN
TESTING OF DWELLINGS			
All Units			
Tested For Radon Levels	0.3%	6.3%	3.7%
Tested Units Needing More Work	0.0%	8.9%	8.6%
Units With Basements			
Tested For Radon Levels	5.4%	7.0%	6.8%
Tested Units Needing More Work	0.0%	11.2%	10.0%
Units With Crawl Spaces			
Tested For Radon Levels	0.0%	6.5%	3.7%
Tested Units Needing More Work	0.0%	11.5%	11.5%
Units With Slabs			
Tested For Radon Levels	0.0%	5.4%	2.1%
Tested Units Needing More Work	0.0%	1.4%	1.4%
CONSTRUCTION METHOD			
DWELLINGS WITH RADON REDUCING FEATURES			
Conventional Constructed On Site			
With radon reducing features	9.4%	35.8%	24.2%
No radon reducing features	90.6%	64.2%	75.8%
Prefabricated Units (Panelized)			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%
Modular			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%
ALL Dwellings			
With radon reducing features	9.4%	35.8%	24.2%
No radon reducing features	90.6%	64.2%	75.8%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%
SIZE OF BUILDER			
DWELLINGS WITH RADON REDUCING FEATURES			
One to Ten Dwellings Per Year			
With radon reducing features	2.0%	10.1%	6.5%
No radon reducing features	23.9%	37.1%	31.3%
Eleven To Twenty-Five Dwellings Per Year			
With radon reducing features	7.4%	0.0%	3.3%
No radon reducing features	9.8%	15.9%	13.2%
Twenty-Six To 100 Dwellings Per Year			
With radon reducing features	0.0%	25.7%	14.4%
No radon reducing features	43.5%	11.3%	25.5%
Over 100 Dwellings Per Year			
With radon reducing features	0.0%	0.0%	0.0%
No radon reducing features	13.5%	0.0%	5.9%

	AL & MS	KY & TN	E S CEN
METHODS EMPLOYED TO REDUCE RADON			
Dwellings With Basements			
Rough-in for subslab ventilation	0.0%	2.7%	1.5%
Passive stack subslab ventilation	1.9%	17.2%	10.4%
Fan-driven subslab depressurization	0.0%	2.3%	1.3%
Only sealed entry routes	3.0%	7.8%	5.7%
None	1.4%	2.4%	2.0%
SUBTOTAL -- BASEMENTS	6.2%	32.4%	20.9%
Dwellings With Crawl Spaces			
Passive stack subslab ventilation	0.9%	7.5%	4.6%
Fan-driven (active) ventilation	0.0%	0.3%	0.1%
Foundation Wall Vents	18.5%	3.9%	10.3%
None	16.9%	27.3%	22.7%
SUBTOTAL -- CRAWL SPACES	36.3%	38.9%	37.7%
Dwellings With Slabs			
Rough-in for subslab ventilation	0.0%	0.7%	0.4%
Passive stack subslab ventilation	6.7%	8.6%	7.8%
Fan-driven subslab depressurization	0.0%	0.0%	0.0%
Only sealed entry routes	35.4%	14.1%	23.5%
None	15.5%	5.3%	9.8%
SUBTOTAL -- SLABS	57.5%	28.7%	41.4%
TOTAL	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS			
(Multiple Answers Possible)			
Dwellings With Basements			
Polyethylene/other membrn under slab	78.4%	91.3%	85.6%
Membrane on frndtn. walls	21.6%	6.5%	13.2%
Caulk around slab, wall opngs. & joints	5.4%	63.0%	37.6%
Seal interior of foundation walls	0.0%	5.4%	3.0%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%
Install air tight sump pit covers	0.0%	58.6%	32.8%
Other	0.0%	0.0%	0.0%
None	21.6%	8.7%	14.4%
TOTAL (may exceed 100%)	127.0%	233.5%	186.5%
SEALING METHODS -- SLABS			
(Multiple Answers Possible)			
Dwellings With Slabs			
Polyethylene/other membrn under slab	71.9%	66.9%	69.1%
Membrane on frndtn. walls	0.0%	3.7%	2.1%
Caulk around slab, wall opngs. & joints	7.0%	28.4%	18.9%
Seal interior of foundation walls	0.0%	3.7%	2.1%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%
Install air tight sump pit covers	0.0%	14.9%	8.3%
Other	0.0%	0.0%	0.0%
None	26.9%	20.9%	23.5%
TOTAL (may exceed 100%)	105.9%	138.3%	124.0%

	AL & MS	KY & TN	E S CEN
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)			
Dwellings On Basements And Slabs			
Crushed aggregate 4" or more deep	42.6%	82.7%	65.0%
Crushed aggregate less than 4" deep	23.6%	0.0%	10.4%
Sand	34.9%	5.8%	18.6%
Strips of geotextile drainage mat	0.5%	0.6%	0.6%
Sheets of rigid foam insulation	0.0%	33.3%	18.6%
Perforated plastic pipe	21.1%	58.1%	41.8%
Plastic sheet (vapor barrier)	63.9%	86.2%	76.4%
Other	1.1%	28.8%	16.6%
None	4.0%	2.1%	2.9%
TOTAL (may exceed 100%)	191.7%	297.6%	250.9%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)			
Dwellings On Basements			
Crushed aggregate 4" or more deep	89.2%	96.7%	93.4%
Crushed aggregate less than 4" deep	0.0%	0.0%	0.0%
Sand	10.8%	1.1%	5.4%
Strips of geotextile drainage mat	5.4%	1.1%	3.0%
Sheets of rigid foam insulation	0.0%	21.8%	12.2%
Perforated plastic pipe	5.4%	79.6%	46.8%
Plastic sheet (vapor barrier)	59.4%	92.4%	77.8%
Other	5.4%	45.7%	27.9%
None	29.8%	3.3%	15.0%
TOTAL (may exceed 100%)	205.4%	341.6%	281.5%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)			
Dwellings On Slabs			
Crushed aggregate 4" or more deep	37.5%	66.9%	53.9%
Crushed aggregate less than 4" deep	26.2%	0.0%	11.5%
Sand	37.5%	11.0%	22.7%
Strips of geotextile drainage mat	0.0%	0.0%	0.0%
Sheets of rigid foam insulation	0.0%	46.4%	25.9%
Perforated plastic pipe	22.9%	34.0%	29.1%
Plastic sheet (vapor barrier)	64.4%	79.2%	72.6%
Other	0.6%	9.8%	5.7%
None	1.2%	0.7%	0.9%
TOTAL (may exceed 100%)	190.2%	248.0%	222.5%

	AL & MS	KY & TN	E S CEN
COST OF PASSIVE SUB-SLAB VENTILATION			
Sample Size	5	21	26
Dwellings			
Less than \$200	16.7%	87.8%	74.8%
\$200 to \$299	10.0%	7.3%	7.8%
\$300 to \$399	73.3%	4.9%	17.4%
\$400 to \$499	0.0%	0.0%	0.0%
\$500 to \$599	0.0%	0.0%	0.0%
\$600 to \$799	0.0%	0.0%	0.0%
\$800 or greater	0.0%	0.0%	0.0%
TOTAL	100.0%	100.0%	100.0%
COST OF ACTIVE SUB-SLAB VENTILATION			
Sample Size	0	10	10
Dwellings			
Less than \$450	0.0%	20.6%	20.6%
\$450 to \$549	0.0%	58.8%	58.8%
\$550 to \$649	0.0%	7.4%	7.4%
\$650 to \$749	0.0%	0.0%	0.0%
\$750 to \$849	0.0%	7.4%	7.4%
\$850 to \$1049	0.0%	5.9%	5.9%
\$1050 or greater	0.0%	0.0%	0.0%
TOTAL	0.0%	100.0%	100.0%

	AR & OK	LA & E TX	W TX	W S CEN
SAMPLE SIZE				
Units	386	449	497	1332
Builders	46	41	71	158
WGHTD AVERAGE UNITS PER BLDR	8.4	10.9	7.0	8.8
TYPE OF HOUSE: WITH RADON REDUCING FEATURES				
One Story Dwellings With Basements				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	2.7%	1.3%	4.5%	2.9%
One story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	2.3%	0.6%	0.8%	0.9%
One Story Dwellings On Slabs				
With radon reducing features	5.7%	0.0%	1.0%	1.1%
No radon reducing features	70.5%	63.7%	49.2%	58.0%
Two Story Dwellings With Basements				
With radon reducing features	0.0%	0.0%	0.2%	0.1%
No radon reducing features	1.7%	0.6%	0.5%	0.7%
Two Story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	1.4%	1.1%	0.2%	0.7%
Two Story Dwellings On Slabs				
With radon reducing features	4.1%	0.0%	0.2%	0.6%
No radon reducing features	11.3%	27.4%	37.5%	30.0%
Three Story Dwellings With Basements				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%
Three Story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%
Three Story Dwellings On Slabs				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.1%	2.1%	1.0%
Houses on piers	0.3%	5.2%	3.9%	4.0%
TOTAL	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS				
Basements				
With radon reducing features	0.0%	0.0%	0.2%	0.1%
No radon reducing features	4.4%	2.1%	5.1%	3.7%
Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	3.8%	1.8%	1.0%	1.7%
Slabs on Grade				
With radon reducing features	9.8%	0.0%	1.2%	1.7%
No radon reducing features	82.0%	96.2%	92.5%	92.8%
TOTAL	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS				
With radon reducing features	9.8%	0.0%	1.4%	1.8%
No radon reducing features	90.2%	100.0%	98.6%	98.2%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%

	AR & OK	LA & E TX	W TX	W S CEN
TESTING OF DWELLINGS				
All Units				
Tested For Radon Levels	13.7%	0.9%	1.2%	2.6%
Tested Units Needing More Work	0.0%	0.0%	0.0%	0.0%
Units With Basements				
Tested For Radon Levels	0.0%	0.0%	14.3%	9.0%
Tested Units Needing More Work	0.0%	0.0%	0.0%	0.0%
Units With Crawl Spaces				
Tested For Radon Levels	0.0%	0.0%	0.0%	0.0%
Tested Units Needing More Work	0.0%	0.0%	0.0%	0.0%
Units With Slabs				
Tested For Radon Levels	15.0%	0.9%	0.4%	2.4%
Tested Units Needing More Work	0.0%	0.0%	0.0%	0.0%
CONSTRUCTION METHOD				
DWELLINGS WITH RADON REDUCING FEATURES				
Conventional Constructed On Site				
With radon reducing features	9.8%	0.0%	1.4%	1.8%
No radon reducing features	90.2%	100.0%	98.6%	98.2%
Prefabricated Units (Panelized)				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%
Modular				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%
ALL Dwellings				
With radon reducing features	9.8%	0.0%	1.4%	1.8%
No radon reducing features	90.2%	100.0%	98.6%	98.2%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%
SIZE OF BUILDER				
DWELLINGS WITH RADON REDUCING FEATURES				
One to Ten Dwellings Per Year				
With radon reducing features	0.0%	0.0%	1.4%	0.6%
No radon reducing features	24.1%	23.6%	33.9%	28.3%
Eleven To Twenty-Five Dwellings Per Year				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	24.9%	8.0%	11.6%	11.7%
Twenty-Six To 100 Dwellings Per Year				
With radon reducing features	9.8%	0.0%	0.0%	1.2%
No radon reducing features	16.8%	29.6%	19.9%	23.7%
Over 100 Dwellings Per Year				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	24.4%	38.7%	33.2%	34.5%

	AR & OK	LA & E TX	W TX	W S CEN
METHODS EMPLOYED TO REDUCE RADON				
Dwellings With Basements				
Rough-in for subslab ventilation	0.0%	0.0%	0.1%	0.0%
Passive stack subslab ventilation	0.0%	0.0%	0.2%	0.1%
Fan-driven subslab depressurization	0.0%	0.0%	0.0%	0.0%
Only sealed entry routes	2.9%	2.0%	4.8%	3.3%
None	1.6%	0.1%	0.3%	0.3%
SUBTOTAL -- BASEMENTS	4.4%	2.1%	5.3%	3.8%
Dwellings With Crawl Spaces				
Passive stack subslab ventilation	0.0%	0.0%	0.0%	0.0%
Fan-driven (active) ventilation	0.0%	0.0%	0.0%	0.0%
Foundation Wall Vents	1.4%	0.0%	0.0%	0.2%
None	2.3%	1.8%	1.0%	1.5%
SUBTOTAL -- CRAWL SPACES	3.8%	1.8%	1.0%	1.7%
Dwellings With Slabs				
Rough-in for subslab ventilation	0.0%	0.0%	0.1%	0.1%
Passive stack subslab ventilation	9.8%	0.0%	1.2%	1.7%
Fan-driven subslab depressurization	0.0%	0.0%	0.0%	0.0%
Only sealed entry routes	42.3%	51.8%	36.6%	43.8%
None	39.6%	44.3%	55.7%	48.9%
SUBTOTAL -- SLABS	91.8%	96.2%	93.7%	94.5%
TOTAL	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS				
(Multiple Answers Possible)				
Dwellings With Basements				
Polyethylene/other membrn under slab	64.7%	81.0%	82.1%	79.5%
Membrane on frndtn. walls	23.5%	0.0%	11.3%	8.0%
Caulk around slab, wall opngs. & joints	5.9%	14.2%	1.4%	7.4%
Seal interior of foundation walls	5.9%	0.0%	0.0%	0.7%
Locate sump access outside of bsmt.	5.9%	0.0%	0.0%	0.7%
Install air tight sump pit covers	5.9%	0.0%	0.0%	0.7%
Other	0.0%	0.0%	0.0%	0.0%
None	35.3%	4.8%	6.6%	9.3%
TOTAL (may exceed 100%)	147.1%	100.0%	101.4%	106.3%
SEALING METHODS -- SLABS				
(Multiple Answers Possible)				
Dwellings With Slabs				
Polyethylene/other membrn under slab	39.1%	53.2%	25.8%	39.0%
Membrane on frndtn. walls	15.0%	0.0%	0.4%	2.0%
Caulk around slab, wall opngs. & joints	29.1%	1.9%	15.8%	11.5%
Seal interior of foundation walls	10.7%	1.2%	14.8%	8.5%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	0.0%
Install air tight sump pit covers	0.0%	0.0%	0.0%	0.0%
Other	0.0%	0.0%	0.0%	0.0%
None	43.2%	46.1%	59.6%	51.9%
TOTAL (may exceed 100%)	137.0%	102.3%	116.4%	112.9%

	AR & OK	LA & E TX	W TX	W S CEN
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)				
Dwellings On Basements And Slabs				
Crushed aggregate 4" or more deep	25.7%	7.4%	30.8%	20.2%
Crushed aggregate less than 4" deep	3.5%	0.6%	11.8%	6.0%
Sand	84.8%	93.2%	41.4%	68.7%
Strips of geotextile drainage mat	0.0%	1.4%	0.0%	0.6%
Sheets of rigid foam insulation	29.5%	0.0%	0.0%	3.6%
Perforated plastic pipe	4.0%	2.0%	1.4%	2.0%
Plastic sheet (vapor barrier)	49.4%	70.3%	58.9%	62.6%
Other	1.2%	0.2%	7.1%	3.5%
None	10.0%	3.2%	16.0%	9.8%
TOTAL (may exceed 100%)	208.0%	178.4%	167.3%	177.0%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)				
Dwellings On Basements				
Crushed aggregate 4" or more deep	64.7%	0.0%	12.7%	13.6%
Crushed aggregate less than 4" deep	23.5%	4.8%	0.0%	4.9%
Sand	58.8%	81.0%	90.6%	82.7%
Strips of geotextile drainage mat	0.0%	21.5%	0.0%	9.2%
Sheets of rigid foam insulation	47.1%	0.0%	0.0%	5.7%
Perforated plastic pipe	58.8%	40.5%	3.8%	26.1%
Plastic sheet (vapor barrier)	88.2%	40.5%	12.7%	33.7%
Other	0.0%	0.0%	0.0%	0.0%
None	17.7%	100.0%	20.7%	54.1%
TOTAL (may exceed 100%)	358.8%	288.3%	140.5%	229.8%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)				
Dwellings On Slabs				
Crushed aggregate 4" or more deep	23.8%	7.6%	31.8%	20.5%
Crushed aggregate less than 4" deep	2.5%	0.6%	12.5%	6.2%
Sand	86.1%	93.5%	38.6%	67.7%
Strips of geotextile drainage mat	0.0%	0.9%	0.0%	0.4%
Sheets of rigid foam insulation	28.6%	0.0%	0.0%	3.5%
Perforated plastic pipe	1.4%	1.2%	1.3%	1.3%
Plastic sheet (vapor barrier)	47.5%	71.0%	61.5%	63.9%
Other	1.3%	0.2%	7.5%	3.7%
None	9.6%	1.2%	15.7%	8.8%
TOTAL (may exceed 100%)	200.8%	176.0%	168.9%	175.8%

	AR & OK	LA & E TX	W TX	W S CEN
COST OF PASSIVE SUB-SLAB VENTILATION				
Sample Size	8	3	8	19
Dwellings				
Less than \$200	29.7%	61.5%	70.0%	43.8%
\$200 to \$299	17.6%	0.0%	8.0%	14.2%
\$300 to \$399	41.8%	0.0%	0.0%	27.2%
\$400 to \$499	0.0%	0.0%	0.0%	0.0%
\$500 to \$599	11.0%	38.5%	22.0%	14.8%
\$600 to \$799	0.0%	0.0%	0.0%	0.0%
\$800 or greater	0.0%	0.0%	0.0%	0.0%
TOTAL	100.0%	100.0%	100.0%	100.0%
 COST OF ACTIVE SUB-SLAB VENTILATION				
Sample Size	3	2	0	5
Dwellings				
Less than \$450	33.3%	100.0%	0.0%	0.0%
\$450 to \$549	0.0%	0.0%	0.0%	0.0%
\$550 to \$649	66.7%	0.0%	0.0%	0.0%
\$650 to \$749	0.0%	0.0%	23.9%	0.0%
\$750 to \$849	0.0%	0.0%	0.0%	0.0%
\$850 to \$1049	0.0%	0.0%	0.0%	0.0%
\$1050 or greater	0.0%	0.0%	0.0%	0.0%
TOTAL	100.0%	100.0%	23.9%	0.0%

	AZ & NM & NV	CO & UT	ID & MT & WY	MTN
SAMPLE SIZE				
Units	72	109	55	236
Builders	28	35	29	92
WGHTD AVERAGE UNITS PER BLDR	2.6	3.1	1.9	2.7
TYPE OF HOUSE: WITH RADON REDUCING FEATURES				
One Story Dwellings With Basements				
With radon reducing features	1.5%	8.2%	6.7%	4.9%
No radon reducing features	1.9%	17.8%	29.3%	12.1%
One story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	0.0%	12.5%	1.8%
No radon reducing features	7.1%	6.4%	9.9%	7.3%
One Story Dwellings On Slabs				
With radon reducing features	0.1%	13.0%	4.5%	5.7%
No radon reducing features	46.3%	1.8%	5.8%	23.2%
Two Story Dwellings With Basements				
With radon reducing features	0.1%	2.8%	2.7%	1.5%
No radon reducing features	6.8%	23.5%	11.6%	14.0%
Two Story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	5.5%	3.4%	2.6%
No radon reducing features	6.9%	11.0%	8.1%	8.7%
Two Story Dwellings On Slabs				
With radon reducing features	0.0%	0.8%	1.9%	0.6%
No radon reducing features	27.7%	0.9%	1.6%	13.5%
Three Story Dwellings With Basements				
With radon reducing features	0.0%	5.5%	0.0%	2.1%
No radon reducing features	0.0%	1.8%	0.0%	0.7%
Three Story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	1.4%	0.9%	0.0%	1.0%
Three Story Dwellings On Slabs				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	1.8%	0.3%
Houses on piers	0.0%	0.0%	0.2%	0.0%
TOTAL	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS				
Basements				
With radon reducing features	1.7%	16.5%	9.4%	8.5%
No radon reducing features	8.7%	43.1%	41.0%	26.7%
Crawl Spaces				
With radon reducing features	0.0%	5.5%	15.9%	4.5%
No radon reducing features	15.5%	18.4%	18.1%	17.0%
Slabs on Grade				
With radon reducing features	0.1%	13.8%	6.4%	6.3%
No radon reducing features	74.1%	2.8%	9.2%	37.0%
TOTAL	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS				
With radon reducing features	1.8%	35.8%	31.7%	19.3%
No radon reducing features	98.2%	64.2%	68.3%	80.7%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%

	AZ & NM & NV	CO & UT	ID & MT & WY	MTN
TESTING OF DWELLINGS				
All Units				
Tested For Radon Levels	11.1%	26.1%	14.9%	17.4%
Tested Units Needing More Work	0.0%	6.0%	18.8%	5.8%
Units With Basements				
Tested For Radon Levels	13.4%	20.0%	12.7%	17.6%
Tested Units Needing More Work	0.0%	7.3%	8.3%	6.7%
Units With Crawl Spaces				
Tested For Radon Levels	35.9%	57.3%	24.5%	42.5%
Tested Units Needing More Work	0.0%	3.4%	26.2%	5.5%
Units With Slabs				
Tested For Radon Levels	5.6%	2.8%	0.9%	4.9%
Tested Units Needing More Work	0.0%	50.0%	54.4%	4.6%
CONSTRUCTION METHOD				
DWELLINGS WITH RADON REDUCING FEATURES				
Conventional Constructed On Site				
With radon reducing features	1.8%	35.8%	31.7%	19.3%
No radon reducing features	98.2%	64.2%	68.3%	80.7%
Prefabricated Units (Panelized)				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%
Modular				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%
ALL Dwellings				
With radon reducing features	1.8%	35.8%	31.7%	19.3%
No radon reducing features	98.2%	64.2%	68.3%	80.7%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%
SIZE OF BUILDER				
DWELLINGS WITH RADON REDUCING FEATURES				
One to Ten Dwellings Per Year				
With radon reducing features	1.8%	21.1%	22.3%	12.3%
No radon reducing features	71.8%	44.0%	48.7%	57.7%
Eleven To Twenty-Five Dwellings Per Year				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	12.5%	0.0%	0.0%	5.8%
Twenty-Six To 100 Dwellings Per Year				
With radon reducing features	0.0%	14.7%	9.4%	7.0%
No radon reducing features	0.0%	20.2%	19.6%	10.7%
Over 100 Dwellings Per Year				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	13.9%	0.0%	0.0%	6.5%

	AZ & NM & NV	CO & UT	ID & MT & WY	MTN
METHODS EMPLOYED TO REDUCE RADON				
Dwellings With Basements				
Rough-in for subslab ventilation	0.0%	2.3%	10.1%	2.4%
Passive stack subslab ventilation	1.4%	8.8%	8.9%	5.4%
Fan-driven subslab depressurization	0.3%	7.7%	0.5%	3.2%
Only sealed entry routes	2.5%	4.6%	9.1%	4.3%
None	6.2%	36.2%	21.8%	20.1%
SUBTOTAL -- BASEMENTS	10.3%	59.6%	50.4%	35.3%
Dwellings With Crawl Spaces				
Passive stack subslab ventilation	0.0%	0.0%	10.9%	1.6%
Fan-driven (active) ventilation	0.0%	5.5%	5.0%	2.9%
Foundation Wall Vents	2.8%	0.9%	0.2%	1.7%
None	12.7%	17.4%	17.8%	15.3%
SUBTOTAL -- CRAWL SPACES	15.5%	23.9%	34.0%	21.4%
Dwellings With Slabs				
Rough-in for subslab ventilation	0.0%	0.9%	0.0%	0.4%
Passive stack subslab ventilation	0.0%	13.8%	6.4%	6.3%
Fan-driven subslab depressurization	0.1%	0.0%	0.0%	0.1%
Only sealed entry routes	15.2%	0.0%	1.8%	7.3%
None	58.9%	1.8%	7.4%	29.3%
SUBTOTAL -- SLABS	74.2%	16.5%	15.6%	43.3%
TOTAL	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS (Multiple Answers Possible)				
Dwellings With Basements				
Polyethylene/other membrn under slab	40.3%	20.0%	3.6%	27.1%
Membrane on frndtn. walls	0.0%	9.2%	13.1%	5.5%
Caulk around slab, wall opngs. & joints	13.4%	13.8%	10.8%	13.2%
Seal interior of foundation walls	13.4%	4.6%	0.0%	8.1%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	0.0%
Install air tight sump pit covers	0.0%	12.3%	0.0%	4.8%
Other	0.0%	0.0%	0.0%	0.0%
None	59.7%	64.7%	72.4%	63.5%
TOTAL (may exceed 100%)	126.9%	124.6%	100.0%	122.1%
SEALING METHODS -- SLABS (Multiple Answers Possible)				
Dwellings With Slabs				
Polyethylene/other membrn under slab	7.5%	5.6%	0.0%	5.6%
Membrane on frndtn. walls	13.1%	0.0%	40.9%	12.1%
Caulk around slab, wall opngs. & joints	7.5%	83.4%	11.7%	37.4%
Seal interior of foundation walls	5.6%	0.0%	0.0%	2.6%
Locate sump access outside of bsmt.	3.8%	0.0%	0.0%	1.7%
Install air tight sump pit covers	3.8%	5.6%	0.0%	3.9%
Other	0.0%	0.0%	0.0%	0.0%
None	79.4%	11.1%	47.4%	48.3%
TOTAL (may exceed 100%)	120.6%	105.6%	100.0%	111.8%

	AZ & NM & NV	CO & UT	ID & MT & WY	MTN
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)				
Dwellings On Basements And Slabs				
Crushed aggregate 4" or more deep	88.5%	88.0%	81.9%	87.3%
Crushed aggregate less than 4" deep	4.9%	2.4%	7.4%	4.3%
Sand	14.8%	19.3%	14.7%	16.5%
Strips of geotextile drainage mat	9.9%	7.2%	6.4%	8.3%
Sheets of rigid foam insulation	14.8%	43.4%	59.3%	32.4%
Perforated plastic pipe	3.3%	19.3%	28.5%	13.2%
Plastic sheet (vapor barrier)	14.5%	51.8%	23.0%	30.2%
Other	14.8%	1.2%	2.8%	7.8%
None	7.3%	8.4%	13.5%	8.6%
TOTAL (may exceed 100%)	172.8%	241.0%	237.5%	208.6%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)				
Dwellings On Basements				
Crushed aggregate 4" or more deep	73.1%	84.6%	78.2%	78.3%
Crushed aggregate less than 4" deep	0.0%	3.1%	9.6%	2.6%
Sand	0.0%	1.5%	19.3%	3.4%
Strips of geotextile drainage mat	0.0%	9.2%	8.4%	4.8%
Sheets of rigid foam insulation	53.8%	29.2%	57.5%	44.8%
Perforated plastic pipe	26.9%	23.1%	33.7%	26.4%
Plastic sheet (vapor barrier)	46.3%	43.1%	30.1%	42.6%
Other	13.4%	1.5%	0.0%	6.9%
None	59.7%	10.7%	1.4%	32.2%
TOTAL (may exceed 100%)	273.1%	206.1%	238.2%	242.1%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)				
Dwellings On Slabs				
Crushed aggregate 4" or more deep	90.6%	100.0%	94.1%	94.8%
Crushed aggregate less than 4" deep	5.6%	0.0%	0.0%	2.6%
Sand	16.9%	83.4%	0.0%	40.1%
Strips of geotextile drainage mat	11.2%	0.0%	0.0%	5.2%
Sheets of rigid foam insulation	9.4%	94.5%	64.9%	50.4%
Perforated plastic pipe	0.0%	5.6%	11.7%	3.9%
Plastic sheet (vapor barrier)	10.1%	83.4%	0.0%	36.9%
Other	15.0%	0.0%	11.7%	8.7%
None	0.0%	0.0%	52.7%	7.8%
TOTAL (may exceed 100%)	158.8%	366.7%	235.0%	250.3%

	AZ & NM & NV	CO & UT	ID & MT & WY	MTN
COST OF PASSIVE SUB-SLAB VENTILATION				
Sample Size	5	13	7	25
Dwellings				
Less than \$200	80.0%	18.4%	31.3%	25.2%
\$200 to \$299	0.0%	2.0%	25.0%	8.6%
\$300 to \$399	0.0%	32.7%	37.5%	32.5%
\$400 to \$499	0.0%	0.0%	6.3%	1.8%
\$500 to \$599	0.0%	0.0%	0.0%	0.0%
\$600 to \$799	20.0%	4.1%	0.0%	3.7%
\$800 or greater	0.0%	42.9%	0.0%	28.2%
TOTAL	100.0%	100.0%	100.0%	100.0%
 COST OF ACTIVE SUB-SLAB VENTILATION				
Sample Size	2	8	4	14
Dwellings				
Less than \$450	0.0%	3.9%	14.3%	5.1%
\$450 to \$549	0.0%	0.0%	0.0%	0.0%
\$550 to \$649	80.0%	0.0%	28.6%	6.3%
\$650 to \$749	0.0%	15.4%	0.0%	12.9%
\$750 to \$849	0.0%	0.0%	0.0%	0.0%
\$850 to \$1049	20.0%	50.0%	0.0%	42.4%
\$1050 or greater	0.0%	30.8%	57.1%	33.3%
TOTAL	100.0%	100.0%	100.0%	100.0%

	N CA	S CA & HI	OR	WA & AK	PAC
SAMPLE SIZE					
Units	163	88	84	152	487
Builders	25	25	34	51	135
WGHTD AVERAGE UNITS PER BLDR	6.5	3.5	2.5	3.0	3.9
TYPE OF HOUSE: WITH RADON REDUCING FEATURES					
One Story Dwellings With Basements					
With radon reducing features	0.0%	0.0%	0.6%	4.4%	1.5%
No radon reducing features	2.1%	2.5%	5.9%	6.8%	4.2%
One story Dwellings With Crawl Spaces					
With radon reducing features	0.0%	0.0%	5.4%	3.3%	1.6%
No radon reducing features	5.1%	4.6%	43.7%	17.6%	13.3%
One Story Dwellings On Slabs					
With radon reducing features	0.0%	0.0%	0.0%	3.5%	1.1%
No radon reducing features	61.5%	39.6%	4.4%	2.5%	29.0%
Two Story Dwellings With Basements					
With radon reducing features	0.0%	0.0%	0.0%	4.2%	1.4%
No radon reducing features	0.5%	5.3%	3.0%	17.1%	7.7%
Two Story Dwellings With Crawl Spaces					
With radon reducing features	0.0%	0.2%	3.0%	1.9%	1.0%
No radon reducing features	7.5%	3.5%	30.1%	30.7%	16.3%
Two Story Dwellings On Slabs					
With radon reducing features	0.0%	0.0%	0.0%	1.8%	0.6%
No radon reducing features	21.5%	37.1%	4.0%	1.6%	18.1%
Three Story Dwellings With Basements					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	2.1%	0.0%	4.6%	2.2%
Three Story Dwellings With Crawl Spaces					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.3%	0.0%	0.0%	0.1%
Three Story Dwellings On Slabs					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.9%	0.0%	0.0%	0.3%
Houses on piers	1.8%	3.7%	0.0%	0.1%	1.7%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS					
Basements					
With radon reducing features	0.0%	0.0%	0.6%	8.6%	2.9%
No radon reducing features	2.7%	10.4%	8.9%	28.5%	14.2%
Crawl Spaces					
With radon reducing features	0.0%	0.2%	8.3%	5.2%	2.7%
No radon reducing features	12.9%	8.8%	73.8%	48.3%	29.8%
Slabs on Grade					
With radon reducing features	0.0%	0.0%	0.0%	5.3%	1.7%
No radon reducing features	84.4%	80.7%	8.3%	4.1%	48.7%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS					
With radon reducing features	0.0%	0.2%	8.9%	19.1%	7.2%
No radon reducing features	100.0%	99.8%	91.1%	80.9%	92.8%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%

	N CA	S CA & HI	OR	WA & AK	PAC
TESTING OF DWELLINGS					
All Units					
Tested For Radon Levels	0.0%	7.4%	10.4%	2.6%	4.4%
Tested Units Needing More Work	0.0%	0.0%	0.0%	0.0%	0.0%
Units With Basements					
Tested For Radon Levels	0.0%	32.9%	0.0%	1.3%	7.1%
Tested Units Needing More Work	0.0%	0.0%	0.0%	0.0%	0.0%
Units With Crawl Spaces					
Tested For Radon Levels	0.0%	14.7%	12.6%	3.7%	6.8%
Tested Units Needing More Work	0.0%	0.0%	0.0%	0.0%	0.0%
Units With Slabs					
Tested For Radon Levels	0.0%	3.3%	0.0%	2.1%	1.8%
Tested Units Needing More Work	0.0%	0.0%	0.0%	0.0%	0.0%
CONSTRUCTION METHOD					
DWELLINGS WITH RADON REDUCING FEATURES					
Conventional Constructed On Site					
With radon reducing features	0.0%	0.2%	8.9%	19.1%	7.2%
No radon reducing features	100.0%	99.8%	91.1%	80.9%	92.8%
Prefabricated Units (Panelized)					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
Modular					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
ALL Dwellings					
With radon reducing features	0.0%	0.2%	8.9%	19.1%	7.2%
No radon reducing features	100.0%	99.8%	91.1%	80.9%	92.8%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%
SIZE OF BUILDER					
DWELLINGS WITH RADON REDUCING FEATURES					
One to Ten Dwellings Per Year					
With radon reducing features	0.0%	0.2%	8.9%	5.9%	3.0%
No radon reducing features	20.9%	56.4%	91.1%	65.8%	54.7%
Eleven To Twenty-Five Dwellings Per Year					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	8.6%	0.0%	0.0%	7.2%	4.4%
Twenty-Six To 100 Dwellings Per Year					
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	54.0%	43.4%	0.0%	7.9%	29.6%
Over 100 Dwellings Per Year					
With radon reducing features	0.0%	0.0%	0.0%	13.2%	4.3%
No radon reducing features	16.6%	0.0%	0.0%	0.0%	4.0%

	N CA	S CA & HI	OR	WA & AK	PAC
METHODS EMPLOYED TO REDUCE RADON					
Dwellings With Basements					
Rough-in for subslab ventilation	0.0%	3.0%	0.0%	0.0%	1.0%
Passive stack subslab ventilation	0.0%	0.0%	0.0%	1.7%	0.5%
Fan-driven subslab depressurization	0.0%	0.0%	0.6%	6.9%	2.3%
Only sealed entry routes	0.6%	2.3%	3.6%	22.6%	8.6%
None	2.1%	5.1%	5.4%	5.9%	4.6%
SUBTOTAL -- BASEMENTS	2.7%	10.4%	9.5%	37.1%	17.1%
Dwellings With Crawl Spaces					
Passive stack subslab ventilation	0.0%	0.2%	3.6%	3.4%	1.6%
Fan-driven (active) ventilation	0.0%	0.0%	4.8%	1.8%	1.1%
Foundation Wall Vents	3.1%	4.6%	28.6%	9.9%	8.6%
None	9.8%	4.2%	45.2%	38.5%	21.2%
SUBTOTAL -- CRAWL SPACES	12.9%	9.0%	82.1%	53.5%	32.5%
Dwellings With Slabs					
Rough-in for subslab ventilation	0.0%	2.7%	1.2%	0.0%	1.0%
Passive stack subslab ventilation	0.0%	0.0%	0.0%	1.4%	0.5%
Fan-driven subslab depressurization	0.0%	0.0%	0.0%	3.8%	1.2%
Only sealed entry routes	45.6%	19.2%	3.6%	1.4%	18.1%
None	38.9%	58.8%	3.6%	2.6%	29.6%
SUBTOTAL -- SLABS	84.4%	80.7%	8.3%	9.3%	50.4%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS					
(Multiple Answers Possible)					
Dwellings With Basements					
Polyethylene/other membrn under slab	22.9%	51.2%	37.5%	67.2%	48.0%
Membrane on frndtn. walls	22.9%	11.0%	18.8%	5.3%	12.9%
Caulk around slab, wall opngs. & joints	0.0%	11.0%	0.0%	41.7%	17.1%
Seal interior of foundation walls	0.0%	29.2%	0.0%	0.0%	9.4%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	0.0%	0.0%
Install air tight sump pit covers	0.0%	0.0%	0.0%	0.0%	0.0%
Other	0.0%	0.0%	0.0%	0.0%	0.0%
None	77.1%	48.8%	56.3%	16.0%	45.8%
TOTAL (may exceed 100%)	122.9%	151.2%	112.5%	130.1%	133.2%
SEALING METHODS -- SLABS					
(Multiple Answers Possible)					
Dwellings With Slabs					
Polyethylene/other membrn under slab	34.3%	27.2%	28.6%	30.6%	30.2%
Membrane on frndtn. walls	19.6%	2.6%	0.0%	0.0%	5.6%
Caulk around slab, wall opngs. & joints	23.3%	2.6%	57.1%	41.2%	26.2%
Seal interior of foundation walls	0.0%	3.3%	0.0%	0.0%	1.1%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	0.0%	0.0%
Install air tight sump pit covers	0.0%	0.0%	0.0%	0.0%	0.0%
Other	0.0%	0.0%	0.0%	0.0%	0.0%
None	46.1%	72.9%	42.9%	28.2%	48.5%
TOTAL (may exceed 100%)	123.3%	108.5%	128.6%	100.0%	111.5%

	N CA	S CA & HI	OR	WA & AK	PAC
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)					
Dwellings On Basements And Slabs					
Crushed aggregate 4" or more deep	33.6%	22.4%	66.7%	92.6%	52.8%
Crushed aggregate less than 4" deep	28.4%	3.8%	0.0%	4.6%	9.6%
Sand	97.2%	91.6%	33.3%	18.0%	62.6%
Strips of geotextile drainage mat	0.8%	1.3%	6.7%	2.8%	2.2%
Sheets of rigid foam insulation	0.7%	2.9%	53.3%	91.5%	36.7%
Perforated plastic pipe	2.5%	9.4%	33.3%	30.8%	17.3%
Plastic sheet (vapor barrier)	99.3%	53.7%	33.3%	52.7%	62.2%
Other	4.1%	0.0%	26.7%	0.0%	3.9%
None	1.5%	6.6%	33.3%	5.0%	7.8%
TOTAL (may exceed 100%)	268.0%	191.6%	286.7%	298.0%	255.2%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)					
Dwellings On Basements					
Crushed aggregate 4" or more deep	85.4%	51.2%	37.5%	93.5%	71.7%
Crushed aggregate less than 4" deep	14.6%	0.0%	0.0%	3.0%	4.5%
Sand	62.2%	84.3%	0.0%	13.4%	46.6%
Strips of geotextile drainage mat	22.9%	11.0%	12.5%	3.6%	11.6%
Sheets of rigid foam insulation	22.9%	22.0%	50.0%	89.4%	47.2%
Perforated plastic pipe	47.9%	29.2%	37.5%	34.7%	36.4%
Plastic sheet (vapor barrier)	100.0%	51.2%	37.5%	53.0%	62.1%
Other	77.1%	0.0%	12.5%	0.0%	20.1%
None	47.9%	15.7%	62.5%	6.3%	25.6%
TOTAL (may exceed 100%)	481.0%	264.7%	250.0%	296.7%	325.9%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)					
Dwellings On Slabs					
Crushed aggregate 4" or more deep	32.0%	18.7%	100.0%	88.8%	53.7%
Crushed aggregate less than 4" deep	28.8%	4.3%	0.0%	11.2%	12.0%
Sand	98.3%	92.5%	71.4%	36.5%	73.4%
Strips of geotextile drainage mat	0.0%	0.0%	0.0%	0.0%	0.0%
Sheets of rigid foam insulation	0.0%	0.5%	57.1%	100.0%	39.0%
Perforated plastic pipe	1.1%	6.9%	28.6%	15.3%	10.6%
Plastic sheet (vapor barrier)	99.3%	54.0%	28.6%	51.8%	61.4%
Other	1.8%	0.0%	42.9%	0.0%	5.2%
None	0.0%	5.4%	0.0%	0.0%	1.7%
TOTAL (may exceed 100%)	261.2%	182.2%	328.6%	303.5%	256.9%

	N CA	S CA & HI	OR	WA & AK	PAC
COST OF PASSIVE SUB-SLAB VENTILATION					
Sample Size	0	8	6	11	25
Dwellings					
Less than \$200	0.0%	43.5%	40.0%	53.7%	51.4%
\$200 to \$299	0.0%	13.0%	0.0%	5.6%	4.9%
\$300 to \$399	0.0%	13.0%	20.0%	33.3%	30.8%
\$400 to \$499	0.0%	26.1%	20.0%	5.6%	8.3%
\$500 to \$599	0.0%	4.4%	20.0%	0.0%	3.2%
\$600 to \$799	0.0%	0.0%	0.0%	1.9%	1.5%
\$800 or greater	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	0.0%	100.0%	100.0%	100.0%	100.0%
 COST OF ACTIVE SUB-SLAB VENTILATION					
Sample Size	0	1	4	5	10
Dwellings					
Less than \$450	0.0%	100.0%	77.8%	10.3%	10.3%
\$450 to \$549	0.0%	0.0%	0.0%	69.0%	69.0%
\$550 to \$649	0.0%	0.0%	0.0%	0.0%	0.0%
\$650 to \$749	0.0%	0.0%	22.2%	10.3%	10.3%
\$750 to \$849	0.0%	0.0%	0.0%	0.0%	0.0%
\$850 to \$1049	0.0%	0.0%	0.0%	10.3%	10.3%
\$1050 or greater	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	0.0%	100.0%	100.0%	100.0%	100.0%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
SAMPLE SIZE										
Units	186	354	871	753	1294	581	1332	236	487	6092
Builders	81	121	199	171	261	98	158	92	135	1316
WGHTD AVERAGE UNITS PER BLDR	2.3	2.9	4.4	4.7	4.7	5.9	8.8	2.7	3.9	5.2
TYPE OF HOUSE: WITH RADON REDUCING FEATURES										
One Story Dwellings With Basements										
With radon reducing features	7.8%	6.1%	12.1%	23.8%	1.0%	5.5%	0.0%	4.9%	1.5%	4.8%
No radon reducing features	29.2%	29.0%	35.5%	40.4%	8.1%	5.6%	2.9%	12.1%	4.2%	13.8%
One story Dwellings With Crawl Spaces										
With radon reducing features	0.0%	0.0%	3.9%	0.0%	0.7%	1.6%	0.0%	1.8%	1.6%	1.0%
No radon reducing features	0.4%	1.3%	3.7%	3.0%	8.5%	25.0%	0.9%	7.3%	13.3%	6.9%
One Story Dwellings On Slabs										
With radon reducing features	2.8%	0.3%	0.3%	0.9%	2.2%	4.2%	1.1%	5.7%	1.1%	2.0%
No radon reducing features	2.1%	1.8%	6.0%	1.5%	25.6%	25.3%	58.0%	23.2%	29.0%	26.6%
Two Story Dwellings With Basements										
With radon reducing features	11.3%	16.9%	9.3%	14.4%	9.5%	6.0%	0.1%	1.5%	1.4%	6.6%
No radon reducing features	42.3%	37.5%	24.4%	13.8%	11.4%	3.5%	0.7%	14.0%	7.7%	12.4%
Two Story Dwellings With Crawl Spaces										
With radon reducing features	0.0%	0.0%	0.6%	0.0%	1.3%	3.1%	0.0%	2.6%	1.0%	1.0%
No radon reducing features	0.1%	2.1%	2.8%	0.3%	9.5%	7.8%	0.7%	8.7%	16.3%	6.2%
Two Story Dwellings On Slabs										
With radon reducing features	0.7%	0.1%	0.1%	0.8%	0.4%	3.5%	0.6%	0.6%	0.6%	0.7%
No radon reducing features	0.9%	3.5%	0.6%	0.2%	17.7%	7.8%	30.0%	13.5%	18.1%	14.9%
Three Story Dwellings With Basements										
With radon reducing features	0.0%	0.0%	0.1%	0.4%	0.7%	0.2%	0.0%	2.1%	0.0%	0.4%
No radon reducing features	1.9%	0.2%	0.3%	0.0%	1.2%	0.0%	0.0%	0.7%	2.2%	0.7%
Three Story Dwellings With Crawl Spaces										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.7%	0.0%	0.0%	0.2%	0.0%	0.0%	1.0%	0.1%	0.2%
Three Story Dwellings On Slabs										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	1.0%	0.3%	0.3%	0.3%
Houses on piers	0.5%	0.6%	0.3%	0.5%	1.6%	0.8%	4.0%	0.0%	1.7%	1.6%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS										
Basements										
With radon reducing features	19.2%	23.1%	21.5%	38.7%	11.3%	11.7%	0.1%	8.5%	2.9%	11.9%
No radon reducing features	73.7%	67.2%	60.3%	54.6%	20.8%	9.1%	3.7%	26.7%	14.2%	27.0%
Crawl Spaces										
With radon reducing features	0.0%	0.0%	4.6%	0.0%	2.0%	4.7%	0.0%	4.5%	2.7%	2.0%
No radon reducing features	0.4%	4.1%	6.5%	3.4%	18.4%	33.1%	1.7%	17.0%	29.8%	13.4%
Slabs on Grade										
With radon reducing features	3.6%	0.4%	0.5%	1.7%	2.7%	7.8%	1.7%	6.3%	1.7%	2.7%
No radon reducing features	3.0%	5.3%	6.6%	1.7%	44.8%	33.7%	92.8%	37.0%	48.7%	43.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS										
With radon reducing features	22.8%	23.5%	26.5%	40.4%	16.1%	24.2%	1.8%	19.3%	7.2%	16.6%
No radon reducing features	77.2%	76.5%	73.5%	59.6%	83.9%	75.8%	98.2%	80.7%	92.8%	83.4%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
TESTING OF DWELLINGS										
All Units										
Tested For Radon Levels	40.7%	24.9%	21.5%	25.0%	7.7%	3.7%	2.6%	17.4%	4.4%	11.5%
Tested Units Needing More Work	12.9%	16.0%	26.2%	26.1%	9.3%	8.6%	0.0%	5.8%	0.0%	15.0%
Units With Basements										
Tested For Radon Levels	40.8%	24.2%	22.6%	25.5%	11.8%	6.8%	9.0%	17.6%	7.1%	20.1%
Tested Units Needing More Work	13.8%	18.3%	30.0%	27.5%	9.9%	10.0%	0.0%	6.7%	0.0%	20.0%
Units With Crawl Spaces										
Tested For Radon Levels	31.4%	72.7%	25.1%	10.4%	5.4%	3.7%	0.0%	42.5%	6.8%	12.8%
Tested Units Needing More Work	0.0%	0.0%	0.7%	0.5%	8.3%	11.5%	0.0%	5.5%	0.0%	4.3%
Units With Slabs										
Tested For Radon Levels	39.4%	3.4%	3.1%	27.8%	5.9%	2.1%	2.4%	4.9%	1.8%	3.8%
Tested Units Needing More Work	0.0%	5.0%	26.8%	1.2%	8.8%	1.4%	0.0%	4.6%	0.0%	4.8%
CONSTRUCTION METHOD										
DWELLINGS WITH RADON REDUCING FEATURES										
Conventional Constructed On Site										
With radon reducing features	22.8%	23.5%	26.5%	40.4%	16.1%	24.2%	1.8%	19.3%	7.2%	16.6%
No radon reducing features	77.2%	76.5%	73.5%	59.6%	83.9%	75.8%	98.2%	80.7%	92.8%	83.4%
Prefabricated Units (Panelized)										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Modular										
With radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ALL Dwellings										
With radon reducing features	22.8%	23.5%	26.5%	40.4%	16.1%	24.2%	1.8%	19.3%	7.2%	16.6%
No radon reducing features	77.2%	76.5%	73.5%	59.6%	83.9%	75.8%	98.2%	80.7%	92.8%	83.4%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SIZE OF BUILDER										
DWELLINGS WITH RADON REDUCING FEATURES										
One to Ten Dwellings Per Year										
With radon reducing features	22.8%	23.1%	13.2%	22.5%	9.0%	6.5%	0.6%	12.3%	3.0%	9.4%
No radon reducing features	56.1%	53.2%	43.9%	38.4%	40.8%	31.3%	28.3%	57.7%	54.7%	41.9%
Eleven To Twenty-Five Dwellings Per Year										
With radon reducing features	0.0%	0.0%	10.4%	6.2%	1.4%	3.3%	0.0%	0.0%	0.0%	2.1%
No radon reducing features	8.8%	16.7%	6.8%	9.6%	15.5%	13.2%	11.7%	5.8%	4.4%	11.1%
Twenty-Six To 100 Dwellings Per Year										
With radon reducing features	0.0%	0.4%	2.3%	8.3%	3.2%	14.4%	1.2%	7.0%	0.0%	3.6%
No radon reducing features	12.2%	3.0%	17.1%	11.6%	14.1%	25.5%	23.7%	10.7%	29.6%	17.5%
Over 100 Dwellings Per Year										
With radon reducing features	0.0%	0.0%	0.6%	3.4%	2.5%	0.0%	0.0%	0.0%	4.3%	1.4%
No radon reducing features	0.0%	3.7%	5.7%	0.0%	13.5%	5.9%	34.5%	6.5%	4.0%	12.9%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
METHODS EMPLOYED TO REDUCE RADON										
Dwellings With Basements										
Rough-in for subslab ventilation	39.7%	24.2%	16.3%	20.3%	6.2%	1.5%	0.0%	2.4%	1.0%	7.7%
Passive stack subslab ventilation	13.2%	19.7%	17.1%	35.0%	10.0%	10.4%	0.1%	5.4%	0.5%	9.8%
Fan-driven subslab depressurization	6.0%	3.4%	4.3%	3.7%	1.3%	1.3%	0.0%	3.2%	2.3%	2.1%
Only sealed entry routes	5.3%	20.0%	20.4%	15.1%	8.5%	5.7%	3.3%	4.3%	8.6%	9.1%
None	28.7%	23.0%	23.6%	19.2%	6.1%	2.0%	0.3%	20.1%	4.6%	10.1%
SUBTOTAL -- BASEMENTS	93.0%	90.3%	81.8%	93.3%	32.1%	20.9%	3.8%	35.3%	17.1%	38.9%
Dwellings With Crawl Spaces										
Passive stack subslab ventilation	0.0%	0.0%	4.6%	0.0%	2.0%	4.6%	0.0%	1.6%	1.6%	1.6%
Fan-driven (active) ventilation	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	2.9%	1.1%	0.4%
Foundation Wall Vents	0.0%	0.7%	1.7%	0.0%	2.2%	10.3%	0.2%	1.7%	8.6%	2.6%
None	0.4%	3.4%	4.9%	3.4%	16.1%	22.7%	1.5%	15.3%	21.2%	10.8%
SUBTOTAL -- CRAWL SPACES	0.4%	4.1%	11.1%	3.4%	20.4%	37.7%	1.7%	21.4%	32.5%	15.4%
Dwellings With Slabs										
Rough-in for subslab ventilation	0.0%	0.0%	0.5%	0.4%	0.5%	0.4%	0.1%	0.4%	1.0%	0.4%
Passive stack subslab ventilation	2.3%	0.4%	0.4%	1.7%	2.5%	7.8%	1.7%	6.3%	0.5%	2.4%
Fan-driven subslab depressurization	1.3%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.1%	1.2%	0.2%
Only sealed entry routes	0.0%	1.7%	3.4%	1.0%	27.1%	23.5%	43.8%	7.3%	18.1%	20.9%
None	3.0%	3.6%	2.8%	0.3%	17.2%	9.8%	48.9%	29.3%	29.6%	21.8%
SUBTOTAL -- SLABS	6.6%	5.7%	7.1%	3.3%	47.5%	41.4%	94.5%	43.3%	50.4%	45.7%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS (Multiple Answers Possible)										
Dwellings With Basements										
Polyethylene/other membrn under slab	25.8%	58.9%	51.9%	57.5%	50.9%	85.6%	79.5%	27.1%	48.0%	57.0%
Membrane on frndtn. walls	9.4%	8.4%	12.6%	18.1%	3.3%	13.2%	8.0%	5.5%	12.9%	8.7%
Caulk around slab, wall opngs. & joints	13.2%	18.7%	25.3%	20.4%	14.3%	37.6%	7.4%	13.2%	17.1%	16.5%
Seal interior of foundation walls	6.7%	3.8%	11.5%	11.4%	12.5%	3.0%	0.7%	8.1%	9.4%	7.8%
Locate sump access outside of bsmt.	1.0%	2.2%	1.1%	0.6%	1.4%	0.0%	0.7%	0.0%	0.0%	0.8%
Install air tight sump pit covers	7.8%	20.2%	27.4%	25.8%	10.2%	32.8%	0.7%	4.8%	0.0%	11.6%
Other	3.5%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
None	58.8%	36.5%	36.5%	31.2%	40.3%	14.4%	9.3%	63.5%	45.8%	34.1%
TOTAL (may exceed 100%)	126.4%	148.8%	166.4%	165.2%	132.9%	186.5%	106.3%	122.1%	133.2%	136.7%
SEALING METHODS -- SLABS (Multiple Answers Possible)										
Dwellings With Slabs										
Polyethylene/other membrn under slab	35.3%	56.6%	58.9%	42.4%	56.1%	69.1%	39.0%	5.6%	30.2%	44.7%
Membrane on frndtn. walls	9.0%	23.5%	23.2%	8.4%	6.3%	2.1%	2.0%	12.1%	5.6%	8.5%
Caulk around slab, wall opngs. & joints	19.6%	23.5%	6.8%	22.1%	6.3%	18.9%	11.5%	37.4%	26.2%	15.9%
Seal interior of foundation walls	9.0%	0.0%	0.8%	4.6%	3.1%	2.1%	8.5%	2.6%	1.1%	3.7%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	3.5%	0.3%	0.0%	0.0%	1.7%	0.0%	0.5%
Install air tight sump pit covers	0.0%	0.0%	32.0%	19.5%	0.0%	8.3%	0.0%	3.9%	0.0%	5.6%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
None	64.7%	43.4%	32.8%	7.5%	36.9%	23.5%	51.9%	48.3%	48.5%	39.9%
TOTAL (may exceed 100%)	137.6%	147.0%	154.5%	108.0%	109.0%	124.0%	112.9%	111.8%	111.5%	118.8%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)										
Dwellings On Basements And Slabs										
Crushed aggregate 4" or more deep	77.4%	85.1%	77.0%	85.4%	47.7%	65.0%	20.2%	87.3%	52.8%	56.3%
Crushed aggregate less than 4" deep	2.5%	6.2%	7.9%	3.7%	5.4%	10.4%	6.0%	4.3%	9.6%	6.3%
Sand	17.7%	2.5%	17.4%	18.3%	37.3%	18.6%	68.7%	16.5%	62.6%	37.1%
Strips of geotextile drainage mat	8.8%	0.6%	4.0%	2.1%	1.5%	0.6%	0.6%	8.3%	2.2%	2.4%
Sheets of rigid foam insulation	30.7%	32.9%	32.6%	23.2%	24.2%	18.6%	3.6%	32.4%	36.7%	23.1%
Perforated plastic pipe	32.5%	51.3%	39.2%	54.9%	22.9%	41.8%	2.0%	13.2%	17.3%	24.4%
Plastic sheet (vapor barrier)	41.2%	73.4%	64.5%	75.4%	80.2%	76.4%	62.6%	30.2%	62.2%	66.3%
Other	0.7%	4.1%	1.7%	7.2%	6.9%	16.6%	3.5%	7.8%	3.9%	5.8%
None	22.5%	8.4%	11.4%	10.0%	5.7%	2.9%	9.8%	8.6%	7.8%	8.4%
TOTAL (may exceed 100%)	233.9%	264.5%	255.8%	280.1%	231.8%	250.9%	177.0%	208.6%	255.2%	230.1%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)										
Dwellings On Basements										
Crushed aggregate 4" or more deep	75.3%	86.4%	76.4%	85.3%	63.6%	93.4%	13.6%	78.3%	71.7%	62.2%
Crushed aggregate less than 4" deep	2.5%	5.7%	8.1%	3.8%	8.4%	0.0%	4.9%	2.6%	4.5%	5.4%
Sand	16.1%	2.6%	15.3%	18.7%	13.6%	5.4%	82.7%	3.4%	46.6%	29.6%
Strips of geotextile drainage mat	6.2%	0.6%	4.4%	2.0%	2.1%	3.0%	9.2%	4.8%	11.6%	5.1%
Sheets of rigid foam insulation	28.6%	32.2%	28.5%	22.7%	22.9%	12.2%	5.7%	44.8%	47.2%	24.5%
Perforated plastic pipe	30.6%	53.3%	38.8%	54.6%	20.8%	46.8%	26.1%	26.4%	36.4%	32.4%
Plastic sheet (vapor barrier)	40.0%	74.1%	62.9%	75.1%	77.9%	77.8%	33.7%	42.6%	62.1%	60.9%
Other	0.8%	4.6%	2.0%	7.1%	8.8%	27.9%	0.0%	6.9%	20.1%	8.1%
None	22.9%	7.6%	12.4%	10.2%	30.0%	15.0%	54.1%	32.2%	25.6%	28.9%
TOTAL (may exceed 100%)	223.1%	267.2%	248.9%	279.6%	248.1%	281.5%	229.8%	242.1%	325.9%	257.2%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)										
Dwellings On Slabs										
Crushed aggregate 4" or more deep	100.0%	70.6%	64.6%	64.9%	35.4%	53.9%	20.5%	94.8%	53.7%	50.1%
Crushed aggregate less than 4" deep	0.0%	19.9%	11.4%	0.0%	0.6%	11.5%	6.2%	2.6%	12.0%	6.1%
Sand	21.1%	0.0%	33.8%	9.9%	53.4%	22.7%	67.7%	40.1%	73.4%	45.7%
Strips of geotextile drainage mat	42.9%	0.0%	0.0%	2.0%	0.5%	0.0%	0.4%	5.2%	0.0%	2.0%
Sheets of rigid foam insulation	53.4%	52.6%	68.4%	26.7%	29.8%	25.9%	3.5%	50.4%	39.0%	32.6%
Perforated plastic pipe	57.1%	26.8%	63.3%	37.3%	14.3%	29.1%	1.3%	3.9%	10.6%	19.7%
Plastic sheet (vapor barrier)	35.3%	79.8%	72.8%	54.5%	87.0%	72.6%	63.9%	36.9%	61.4%	68.1%
Other	0.0%	0.0%	0.0%	7.9%	3.4%	5.7%	3.7%	8.7%	5.2%	4.0%
None	32.3%	9.5%	32.3%	2.7%	3.9%	0.9%	8.8%	7.8%	1.7%	8.6%
TOTAL (may exceed 100%)	342.1%	259.2%	346.5%	205.8%	228.3%	222.5%	175.8%	250.3%	256.9%	237.0%

	NEW ENG	MID ATL	E N CEN	W N CEN	S ATL	E S CEN	W S CEN	MTN	PAC	US TOTAL
COST OF PASSIVE SUB-SLAB VENTILATION										
Sample Size	39	47	80	92	70	26	19	25	25	423
Dwellings										
Less than \$200	15.3%	20.6%	33.1%	26.3%	37.9%	74.8%	43.8%	25.2%	51.4%	36.2%
\$200 to \$299	22.9%	38.3%	32.1%	34.6%	27.3%	7.8%	14.2%	8.6%	4.9%	25.6%
\$300 to \$399	9.5%	23.0%	16.1%	12.3%	15.4%	17.4%	27.2%	32.5%	30.8%	17.8%
\$400 to \$499	16.7%	10.2%	12.0%	7.3%	4.0%	0.0%	0.0%	1.8%	8.3%	6.1%
\$500 to \$599	29.3%	3.3%	1.2%	12.6%	12.5%	0.0%	14.8%	0.0%	3.2%	7.8%
\$600 to \$799	0.0%	0.9%	1.3%	1.6%	1.1%	0.0%	0.0%	3.7%	1.5%	1.3%
\$800 or greater	6.2%	3.8%	4.2%	5.3%	1.7%	0.0%	0.0%	28.2%	0.0%	5.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
COST OF ACTIVE SUB-SLAB VENTILATION										
Sample Size	12	22	35	40	29	10	5	14	10	177
Dwellings										
Less than \$450	0.0%	24.3%	18.2%	21.8%	43.4%	20.6%	0.0%	5.1%	10.3%	17.6%
\$450 to \$549	4.1%	44.5%	7.9%	18.1%	7.7%	58.8%	0.0%	0.0%	69.0%	21.6%
\$550 to \$649	42.6%	12.9%	9.7%	9.6%	15.2%	7.4%	0.0%	6.3%	0.0%	10.9%
\$650 to \$749	0.0%	2.7%	19.2%	7.2%	10.2%	0.0%	0.0%	12.9%	10.3%	10.2%
\$750 to \$849	27.0%	0.0%	27.5%	4.6%	0.0%	7.4%	0.0%	0.0%	0.0%	7.2%
\$850 to \$1049	4.1%	13.5%	15.5%	23.8%	0.2%	5.9%	0.0%	42.4%	10.3%	17.6%
\$1050 or greater	22.3%	2.1%	1.9%	15.0%	23.5%	0.0%	0.0%	33.3%	0.0%	14.8%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%

APPENDIX D

SINGLE-FAMILY DETACHED USAGE COEFFICIENT TABLES

BY THE THREE RADON EXPOSURE ZONES

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
SAMPLE SIZE				
Units	1893	1977	2222	6092
Builders	449	443	424	1316
WGHTD AVERAGE UNITS PER BLDR	4.2	4.5	5.2	5.2
TYPE OF HOUSE: WITH RADON REDUCING FEATURES				
One Story Dwellings With Basements				
With radon reducing features	12.8%	8.0%	0.1%	4.8%
No radon reducing features	29.9%	18.9%	3.6%	13.8%
One story Dwellings With Crawl Spaces				
With radon reducing features	2.4%	0.5%	0.3%	1.0%
No radon reducing features	6.3%	6.6%	7.0%	6.9%
One Story Dwellings On Slabs				
With radon reducing features	2.3%	1.4%	1.5%	2.0%
No radon reducing features	3.1%	19.4%	48.6%	26.6%
Two Story Dwellings With Basements				
With radon reducing features	16.8%	10.7%	0.7%	6.6%
No radon reducing features	18.0%	18.7%	4.6%	12.4%
Two Story Dwellings With Crawl Spaces				
With radon reducing features	1.7%	0.2%	0.3%	1.0%
No radon reducing features	2.7%	5.6%	5.1%	6.2%
Two Story Dwellings On Slabs				
With radon reducing features	1.6%	0.2%	0.8%	0.7%
No radon reducing features	1.5%	7.5%	23.0%	14.9%
Three Story Dwellings With Basements				
With radon reducing features	0.4%	0.7%	0.0%	0.4%
No radon reducing features	0.2%	0.7%	0.6%	0.7%
Three Story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.2%	0.2%	0.2%
Three Story Dwellings On Slabs				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.1%	0.6%	0.3%
Houses on piers	0.2%	0.7%	2.9%	1.6%
TOTAL	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS				
Basements				
With radon reducing features	30.1%	19.5%	0.8%	11.9%
No radon reducing features	48.2%	38.5%	9.1%	27.0%
Crawl Spaces				
With radon reducing features	4.1%	0.7%	0.7%	2.0%
No radon reducing features	9.0%	12.5%	12.7%	13.4%
Slabs on Grade				
With radon reducing features	3.9%	1.7%	2.4%	2.7%
No radon reducing features	4.6%	27.2%	74.4%	43.0%
TOTAL	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS				
With radon reducing features	38.2%	21.8%	3.9%	16.6%
No radon reducing features	61.9%	78.2%	96.2%	83.4%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
TESTING OF DWELLINGS				
All Units				
Tested For Radon Levels	21.6%	13.8%	4.8%	11.5%
Tested Units Needing More Work	23.9%	15.6%	5.1%	15.0%
Units With Basements				
Tested For Radon Levels	23.3%	19.9%	9.1%	20.1%
Tested Units Needing More Work	27.5%	17.3%	25.7%	20.0%
Units With Crawl Spaces				
Tested For Radon Levels	18.0%	9.7%	4.7%	12.8%
Tested Units Needing More Work	4.9%	3.3%	2.4%	4.3%
Units With Slabs				
Tested For Radon Levels	11.9%	3.2%	4.3%	3.8%
Tested Units Needing More Work	4.2%	11.2%	0.0%	4.8%
CONSTRUCTION METHOD				
DWELLINGS WITH RADON REDUCING FEATURES				
Conventional Constructed On Site				
With radon reducing features	38.2%	21.8%	3.9%	16.57%
No radon reducing features	61.9%	78.2%	96.2%	83.43%
Prefabricated Units (Panelized)				
With radon reducing features	0.0%	0.0%	0.0%	0.00%
No radon reducing features	0.0%	0.0%	0.0%	0.00%
Modular				
With radon reducing features	0.0%	0.0%	0.0%	0.00%
No radon reducing features	0.0%	0.0%	0.0%	0.00%
ALL Dwellings				
With radon reducing features	38.2%	21.8%	3.9%	16.57%
No radon reducing features	61.9%	78.2%	96.2%	83.43%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.00%
SIZE OF BUILDER				
DWELLINGS WITH RADON REDUCING FEATURES				
One to Ten Dwellings Per Year				
With radon reducing features	20.7%	7.6%	2.1%	9.4%
No radon reducing features	34.8%	39.3%	39.1%	41.9%
Eleven To Twenty-Five Dwellings Per Year				
With radon reducing features	8.8%	2.5%	0.0%	2.1%
No radon reducing features	11.4%	8.4%	15.2%	11.1%
Twenty-Six To 100 Dwellings Per Year				
With radon reducing features	6.0%	7.2%	1.7%	3.6%
No radon reducing features	9.6%	25.1%	20.2%	17.5%
Over 100 Dwellings Per Year				
With radon reducing features	2.6%	4.6%	0.0%	1.4%
No radon reducing features	6.1%	5.5%	21.7%	12.9%

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
METHODS EMPLOYED TO REDUCE RADON				
Dwellings With Basements				
Rough-in for subslab ventilation	18.2%	10.3%	2.1%	7.7%
Passive stack subslab ventilation	25.7%	17.0%	0.4%	9.8%
Fan-driven subslab depressurization	4.4%	2.5%	0.4%	2.1%
Only sealed entry routes	14.3%	12.3%	4.6%	9.1%
None	15.8%	16.0%	2.4%	10.1%
SUBTOTAL -- BASEMENTS	78.4%	58.0%	9.9%	38.9%
Dwellings With Crawl Spaces				
Passive stack subslab ventilation	3.6%	0.6%	0.4%	1.6%
Fan-driven (active) ventilation	0.5%	0.1%	0.3%	0.4%
Foundation Wall Vents	3.7%	2.6%	1.6%	2.6%
None	5.3%	9.9%	11.1%	10.8%
SUBTOTAL -- CRAWL SPACES	13.1%	13.1%	13.3%	15.4%
Dwellings With Slabs				
Rough-in for subslab ventilation	0.4%	0.5%	0.1%	0.4%
Passive stack subslab ventilation	3.5%	1.5%	2.4%	2.4%
Fan-driven subslab depressurization	0.4%	0.2%	0.0%	0.2%
Only sealed entry routes	2.7%	14.7%	37.2%	20.9%
None	1.6%	12.0%	37.1%	21.8%
SUBTOTAL -- SLABS	8.5%	28.8%	76.8%	45.7%
TOTAL	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS (Multiple Answers Possible)				
Dwellings With Basements				
Polyethylene/other membrn under slab	59.4%	48.5%	56.7%	57.0%
Membrane on frndtn. walls	13.2%	9.6%	8.0%	8.7%
Caulk around slab, wall opngs. & joints	25.3%	24.9%	13.5%	16.5%
Seal interior of foundation walls	8.3%	10.5%	7.3%	7.8%
Locate sump access outside of bsmt.	0.2%	1.7%	1.4%	0.8%
Install air tight sump pit covers	24.2%	25.8%	7.3%	11.6%
Other	0.1%	0.0%	3.2%	0.1%
None	29.5%	37.1%	36.2%	34.1%
TOTAL (may exceed 100%)	160.1%	158.1%	133.3%	136.7%
SEALING METHODS -- SLABS (Multiple Answers Possible)				
Dwellings With Slabs				
Polyethylene/other membrn under slab	71.6%	45.9%	41.1%	44.7%
Membrane on frndtn. walls	16.3%	7.6%	5.7%	8.5%
Caulk around slab, wall opngs. & joints	21.7%	13.8%	12.7%	15.9%
Seal interior of foundation walls	1.5%	2.2%	7.0%	3.7%
Locate sump access outside of bsmt.	0.9%	0.4%	0.1%	0.5%
Install air tight sump pit covers	20.5%	1.2%	0.0%	5.6%
Other	0.0%	0.0%	0.0%	0.0%
None	19.4%	41.8%	48.4%	39.9%
TOTAL (may exceed 100%)	152.1%	112.9%	115.0%	118.8%

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)				
Dwellings On Basements And Slabs				
Crushed aggregate 4" or more deep	82.0%	70.3%	25.7%	56.3%
Crushed aggregate less than 4" deep	8.0%	8.0%	4.7%	6.3%
Sand	10.9%	29.6%	61.6%	37.1%
Strips of geotextile drainage mat	3.4%	1.8%	1.5%	2.4%
Sheets of rigid foam insulation	33.0%	28.5%	12.5%	23.1%
Perforated plastic pipe	49.1%	33.5%	6.1%	24.4%
Plastic sheet (vapor barrier)	73.0%	65.4%	65.2%	66.3%
Other	3.6%	9.4%	4.7%	5.8%
None	9.7%	6.8%	8.8%	8.4%
TOTAL (may exceed 100%)	272.6%	253.1%	190.6%	230.1%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)				
Dwellings On Basements				
Crushed aggregate 4" or more deep	80.8%	85.2%	69.8%	62.2%
Crushed aggregate less than 4" deep	8.5%	4.7%	1.9%	5.4%
Sand	10.3%	11.9%	28.9%	29.6%
Strips of geotextile drainage mat	3.5%	2.5%	6.9%	5.1%
Sheets of rigid foam insulation	30.2%	37.8%	37.1%	24.5%
Perforated plastic pipe	49.8%	42.1%	39.5%	32.4%
Plastic sheet (vapor barrier)	73.1%	62.1%	58.2%	60.9%
Other	3.7%	12.6%	3.0%	8.1%
None	10.0%	8.2%	21.6%	28.9%
TOTAL (may exceed 100%)	269.8%	267.1%	266.7%	257.2%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)				
Dwellings On Slabs				
Crushed aggregate 4" or more deep	93.7%	40.4%	20.0%	50.1%
Crushed aggregate less than 4" deep	3.0%	14.5%	5.0%	6.1%
Sand	17.0%	65.2%	65.8%	45.7%
Strips of geotextile drainage mat	1.9%	0.2%	0.8%	2.0%
Sheets of rigid foam insulation	58.6%	9.6%	9.3%	32.6%
Perforated plastic pipe	42.9%	16.0%	1.8%	19.7%
Plastic sheet (vapor barrier)	72.3%	72.0%	66.1%	68.1%
Other	2.5%	3.0%	4.9%	4.0%
None	6.7%	4.0%	7.1%	8.6%
TOTAL (may exceed 100%)	298.6%	224.9%	180.8%	237.0%

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
COST OF PASSIVE SUB-SLAB VENTILATION				
Sample Size	217	138	68	423
Dwellings				
Less than \$200	39.0%	28.6%	50.7%	36.2%
\$200 to \$299	29.8%	21.2%	19.5%	25.6%
\$300 to \$399	15.3%	20.7%	15.5%	17.8%
\$400 to \$499	6.4%	8.1%	3.3%	6.1%
\$500 to \$599	3.9%	13.8%	9.8%	7.8%
\$600 to \$799	1.1%	0.8%	0.3%	1.3%
\$800 or greater	4.6%	6.8%	1.1%	5.3%
TOTAL	100.0%	100.0%	100.0%	100.0%
 COST OF ACTIVE SUB-SLAB VENTILATION				
Sample Size	89	62	28	177
Dwellings				
Less than \$450	20.6%	22.6%	60.2%	17.6%
\$450 to \$549	18.0%	21.7%	0.5%	21.6%
\$550 to \$649	11.7%	14.7%	23.7%	10.9%
\$650 to \$749	5.9%	14.7%	10.2%	10.2%
\$750 to \$849	18.0%	3.5%	0.0%	7.2%
\$850 to \$1049	18.6%	10.9%	1.6%	17.6%
\$1050 or greater	7.2%	12.0%	3.8%	14.8%
TOTAL	100.0%	100.0%	100.0%	100.0%

APPENDIX E

MULTIFAMILY USAGE COEFFICIENT TABLES

BY THE THREE RADON EXPOSURE ZONES

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
SAMPLE SIZE				
Units	741	1205	784	2731
Builders	58	58	44	160
WGHTD AVERAGE UNITS PER BLDR	12.8	20.8	17.8	18.6
TYPE OF HOUSE: WITH RADON REDUCING FEATURES				
One Story Dwellings With Basements				
With radon reducing features	5.5%	1.0%	1.3%	3.8%
No radon reducing features	15.7%	6.3%	7.0%	7.8%
One story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	2.0%	3.9%	2.9%	2.6%
One Story Dwellings On Slabs				
With radon reducing features	3.1%	2.3%	0.4%	2.3%
No radon reducing features	16.5%	20.6%	33.4%	24.0%
Two Story Dwellings With Basements				
With radon reducing features	12.6%	0.2%	1.3%	4.2%
No radon reducing features	13.5%	3.6%	8.7%	8.8%
Two Story Dwellings With Crawl Spaces				
With radon reducing features	0.4%	0.0%	0.0%	0.1%
No radon reducing features	1.4%	4.8%	2.2%	2.4%
Two Story Dwellings On Slabs				
With radon reducing features	6.9%	2.4%	0.4%	3.2%
No radon reducing features	8.5%	13.6%	19.7%	14.7%
Three Story Dwellings With Basements				
With radon reducing features	0.5%	0.1%	1.3%	1.2%
No radon reducing features	6.9%	1.5%	4.5%	3.1%
Three Story Dwellings With Crawl Spaces				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.2%	4.2%	0.4%	1.5%
Three Story Dwellings On Slabs				
With radon reducing features	0.4%	9.7%	0.0%	3.7%
No radon reducing features	5.6%	12.4%	13.5%	10.8%
Houses on piers	0.1%	13.2%	2.9%	5.7%
TOTAL	100.0%	100.0%	100.0%	100.0%
TYPE OF FOUNDATION -- EXCEPT PIERS				
Basements				
With radon reducing features	18.7%	1.6%	4.1%	9.4%
No radon reducing features	36.2%	13.1%	20.8%	20.5%
Crawl Spaces				
With radon reducing features	0.4%	0.0%	0.0%	0.1%
No radon reducing features	3.6%	14.9%	5.6%	7.1%
Slabs on Grade				
With radon reducing features	10.4%	16.6%	0.8%	9.9%
No radon reducing features	30.6%	53.8%	68.7%	53.0%
TOTAL	100.0%	100.0%	100.0%	100.0%
ALL DWELLINGS -- EXCEPT ON PIERS				
With radon reducing features	29.5%	18.2%	5.0%	19.4%
No radon reducing features	70.5%	81.8%	95.0%	80.6%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
TESTING OF DWELLINGS				
All Units				
Tested For Radon Levels	15.7%	5.8%	5.9%	10.6%
Tested Units Needing More Work	29.7%	10.0%	0.0%	20.4%
Units With Basements				
Tested For Radon Levels	13.8%	24.3%	16.6%	24.2%
Tested Units Needing More Work	40.8%	14.5%	0.0%	23.4%
Units With Crawl Spaces				
Tested For Radon Levels	19.9%	0.7%	2.4%	3.1%
Tested Units Needing More Work	14.2%	0.0%	0.0%	11.3%
Units With Slabs				
Tested For Radon Levels	17.8%	3.0%	2.3%	5.5%
Tested Units Needing More Work	19.9%	3.0%	0.0%	14.5%
CONSTRUCTION METHOD				
DWELLINGS WITH RADON REDUCING FEATURES				
Conventional Constructed On Site				
With radon reducing features	29.5%	18.2%	5.0%	19.4%
No radon reducing features	70.5%	81.9%	95.0%	80.6%
Prefabricated Units (Panelized)				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%
Modular				
With radon reducing features	0.0%	0.0%	0.0%	0.0%
No radon reducing features	0.0%	0.0%	0.0%	0.0%
ALL Dwellings				
With radon reducing features	29.5%	18.2%	5.0%	19.4%
No radon reducing features	70.5%	81.9%	95.0%	80.6%
TOTAL -- ALL DWELLINGS	100.0%	100.0%	100.0%	100.0%
SIZE OF BUILDER				
DWELLINGS WITH RADON REDUCING FEATURES				
One to Ten Dwellings Per Year				
With radon reducing features	10.0%	2.3%	0.8%	5.4%
No radon reducing features	5.8%	11.4%	10.6%	12.9%
Eleven To Twenty-Five Dwellings Per Year				
With radon reducing features	15.4%	0.0%	0.0%	4.8%
No radon reducing features	27.1%	11.5%	16.3%	16.6%
Twenty-Six To 100 Dwellings Per Year				
With radon reducing features	4.2%	0.5%	4.1%	4.3%
No radon reducing features	22.7%	31.9%	52.4%	36.8%
Over 100 Dwellings Per Year				
With radon reducing features	0.0%	15.4%	0.0%	4.9%
No radon reducing features	14.9%	27.1%	15.7%	14.2%

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
METHODS EMPLOYED TO REDUCE RADON				
Dwellings With Basements				
Rough-in for subslab ventilation	12.6%	4.3%	0.0%	4.9%
Passive stack subslab ventilation	12.6%	1.1%	4.1%	6.5%
Fan-driven subslab depressurization	6.1%	0.5%	0.0%	2.9%
Only sealed entry routes	1.3%	3.1%	1.8%	2.6%
None	22.4%	5.8%	19.0%	13.1%
SUBTOTAL -- BASEMENTS	54.9%	14.7%	24.9%	29.9%
Dwellings With Crawl Spaces				
Passive stack subslab ventilation	0.4%	0.0%	0.0%	0.1%
Fan-driven (active) ventilation	0.0%	0.0%	0.0%	0.0%
Foundation Wall Vents	1.4%	9.4%	1.3%	3.6%
None	2.2%	5.5%	4.3%	3.4%
SUBTOTAL -- CRAWL SPACES	4.0%	14.9%	5.6%	7.2%
Dwellings With Slabs				
Rough-in for subslab ventilation	11.1%	12.4%	0.0%	7.6%
Passive stack subslab ventilation	7.7%	15.4%	0.8%	8.1%
Fan-driven subslab depressurization	2.7%	1.2%	0.0%	1.7%
Only sealed entry routes	10.1%	21.0%	26.8%	21.6%
None	9.4%	20.4%	41.9%	23.8%
SUBTOTAL -- SLABS	41.0%	70.4%	69.5%	62.9%
TOTAL	100.0%	100.0%	100.0%	100.0%
SEALING METHODS -- BASEMENTS				
(Multiple Answers Possible)				
Dwellings With Basements				
Polyethylene/other membrn under slab	42.7%	34.1%	23.8%	22.7%
Membrane on frndtn. walls	13.6%	15.0%	16.6%	19.6%
Caulk around slab, wall opngs. & joints	15.6%	25.7%	16.6%	14.2%
Seal interior of foundation walls	1.7%	17.7%	0.0%	3.7%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	0.0%
Install air tight sump pit covers	19.1%	6.4%	16.6%	14.6%
Other	0.0%	0.0%	0.0%	0.0%
None	49.8%	46.7%	76.2%	62.1%
TOTAL (may exceed 100%)	142.4%	145.7%	149.9%	136.8%
SEALING METHODS -- SLABS				
(Multiple Answers Possible)				
Dwellings With Slabs				
Polyethylene/other membrn under slab	56.6%	35.9%	39.7%	44.4%
Membrane on frndtn. walls	14.4%	5.8%	0.0%	10.9%
Caulk around slab, wall opngs. & joints	38.0%	11.5%	15.4%	20.0%
Seal interior of foundation walls	0.0%	3.8%	7.5%	6.2%
Locate sump access outside of bsmt.	0.0%	0.0%	0.0%	0.0%
Install air tight sump pit covers	37.5%	26.2%	0.0%	21.8%
Other	0.0%	0.0%	0.0%	0.0%
None	28.9%	31.1%	60.3%	36.1%
TOTAL (may exceed 100%)	175.3%	114.4%	123.0%	139.4%

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
SUBSLAB PREPARATION -- BASEMENTS & SLABS (Multiple Answers Possible)				
Dwellings On Basements And Slabs				
Crushed aggregate 4" or more deep	83.0%	72.3%	52.0%	64.4%
Crushed aggregate less than 4" deep	9.4%	6.7%	2.1%	6.4%
Sand	4.9%	35.8%	44.3%	27.3%
Strips of geotextile drainage mat	0.0%	1.0%	4.2%	0.8%
Sheets of rigid foam insulation	40.3%	56.3%	16.6%	38.2%
Perforated plastic pipe	41.0%	19.4%	9.5%	25.6%
Plastic sheet (vapor barrier)	57.7%	58.3%	48.6%	54.8%
Other	2.8%	0.2%	17.4%	11.3%
None	14.7%	9.0%	20.6%	12.4%
TOTAL (may exceed 100%)	253.8%	258.9%	215.3%	241.3%
SUBSLAB PREPARATION -- BASEMENTS (Multiple Answers Possible)				
Dwellings On Basements				
Crushed aggregate 4" or more deep	81.6%	76.6%	82.8%	71.8%
Crushed aggregate less than 4" deep	5.2%	3.4%	0.0%	3.3%
Sand	3.8%	15.9%	24.3%	19.3%
Strips of geotextile drainage mat	0.0%	0.0%	16.0%	0.6%
Sheets of rigid foam insulation	28.0%	29.0%	32.6%	25.4%
Perforated plastic pipe	44.1%	31.2%	32.6%	26.6%
Plastic sheet (vapor barrier)	43.9%	53.6%	41.1%	39.9%
Other	2.6%	1.1%	11.7%	11.0%
None	16.9%	19.7%	58.4%	36.2%
TOTAL (may exceed 100%)	226.1%	230.5%	299.3%	234.3%
SUBSLAB PREPARATION -- SLABS (Multiple Answers Possible)				
Dwellings On Slabs				
Crushed aggregate 4" or more deep	85.0%	71.4%	40.9%	64.9%
Crushed aggregate less than 4" deep	15.0%	7.4%	2.9%	7.1%
Sand	6.4%	39.9%	51.4%	29.2%
Strips of geotextile drainage mat	0.0%	1.2%	0.0%	0.3%
Sheets of rigid foam insulation	56.8%	62.0%	10.9%	46.1%
Perforated plastic pipe	36.8%	16.9%	1.2%	22.4%
Plastic sheet (vapor barrier)	76.1%	59.3%	51.3%	59.7%
Other	3.0%	0.0%	19.5%	10.1%
None	11.8%	6.7%	7.1%	7.2%
TOTAL (may exceed 100%)	290.9%	264.9%	185.1%	247.0%

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
COST OF PASSIVE SUB-SLAB VENTILATION				
Sample Size	33	17	7	53
Dwellings				
Less than \$200	45.4%	5.8%	47.1%	15.7%
\$200 to \$299	29.1%	53.4%	44.3%	48.0%
\$300 to \$399	11.5%	0.0%	0.0%	7.1%
\$400 to \$499	7.1%	7.3%	0.0%	1.4%
\$500 to \$599	5.1%	31.9%	8.6%	20.8%
\$600 to \$799	0.0%	0.0%	0.0%	0.0%
\$800 or greater	1.8%	1.6%	0.0%	2.6%
TOTAL	100.0%	100.0%	100.0%	95.6%
 COST OF ACTIVE SUB-SLAB VENTILATION				
Sample Size	14	10	1	18
Dwellings				
Less than \$450	56.5%	5.2%	100.0%	32.2%
\$450 to \$549	10.4%	4.4%	0.0%	13.8%
\$550 to \$649	8.2%	44.1%	0.0%	3.2%
\$650 to \$749	1.9%	35.9%	0.0%	6.4%
\$750 to \$849	2.5%	0.0%	0.0%	0.3%
\$850 to \$1049	16.0%	0.0%	0.0%	11.4%
\$1050 or greater	4.6%	10.5%	0.0%	1.1%
TOTAL	100.0%	100.0%	100.0%	68.4%

APPENDIX F

SINGLE-FAMILY DETACHED

PRODUCT USAGE TABLES

BY THE THREE RADON EXPOSURE ZONES

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
<i>All Data in Thousands</i>				
HOUSING STARTS				
Single-Family Detached	100.4	114.2	172.1	386.7
TOTAL HOUSING STARTS (Excluding HUD Code)	100.4	114.2	172.1	386.7
TYPE OF HOUSE: WITH RADON REDUCING FEATURES				
One Story Dwellings With Basements				
With radon reducing features	12.9	9.1	0.1	22.1
No radon reducing features	30.0	21.5	6.2	57.8
One story Dwellings With Crawl Spaces				
With radon reducing features	2.4	0.5	0.5	3.4
No radon reducing features	6.3	7.5	12.0	25.8
One Story Dwellings On Slabs				
With radon reducing features	2.3	1.6	2.6	6.6
No radon reducing features	3.1	22.2	83.7	108.9
Two Story Dwellings With Basements				
With radon reducing features	16.9	12.2	1.2	30.3
No radon reducing features	18.0	21.4	7.9	47.3
Two Story Dwellings With Crawl Spaces				
With radon reducing features	1.7	0.2	0.6	2.5
No radon reducing features	2.7	6.4	8.9	18.0
Two Story Dwellings On Slabs				
With radon reducing features	1.6	0.3	1.4	3.2
No radon reducing features	1.5	8.6	39.5	49.6
Three Story Dwellings With Basements				
With radon reducing features	0.4	0.8	0.0	1.2
No radon reducing features	0.2	0.8	1.1	2.2
Three Story Dwellings With Crawl Spaces				
With radon reducing features	0.0	0.0	0.0	0.0
No radon reducing features	0.0	0.2	0.3	0.5
Three Story Dwellings On Slabs				
With radon reducing features	0.0	0.0	0.0	0.0
No radon reducing features	0.1	0.1	1.1	1.2
Houses on piers	0.2	0.7	5.0	5.9
TOTAL	100.4	114.2	172.1	386.7
TYPE OF FOUNDATION -- EXCEPT PIERS				
Basements				
With radon reducing features	30.2	22.1	1.3	53.6
No radon reducing features	48.3	43.7	15.2	107.3
Crawl Spaces				
With radon reducing features	4.1	0.8	1.1	6.0
No radon reducing features	9.0	14.1	21.2	44.3
Slabs on Grade				
With radon reducing features	3.9	1.9	4.0	9.8
No radon reducing features	4.6	30.8	124.3	159.8
TOTAL	100.2	113.5	167.2	380.8
ALL DWELLINGS -- EXCEPT PIERS				
With radon reducing features	38.2	24.8	6.4	69.4
No radon reducing features	62.0	88.7	160.7	311.4
TOTAL -- ALL DWELLINGS	100.2	113.5	167.2	380.8

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
<i>All Data in Thousands</i>				
TESTING OF DWELLINGS				
All Units				
Tested For Radon Levels	21.7	15.6	8.0	45.3
Tested Units Needing More Work	5.2	2.4	0.4	8.0
Units With Basements				
Tested For Radon Levels	23.4	22.6	15.1	61.1
Tested Units Needing More Work	6.4	3.9	3.9	14.2
Units With Crawl Spaces				
Tested For Radon Levels	18.0	11.0	7.8	36.8
Tested Units Needing More Work	0.9	0.4	0.2	1.4
Units With Slabs				
Tested For Radon Levels	11.9	3.6	7.2	22.7
Tested Units Needing More Work	0.5	0.4	0.0	0.9
CONSTRUCTION METHOD				
DWELLINGS WITH RADON REDUCING FEATURES				
Conventional Constructed On Site				
With radon reducing features	38.3	24.9	6.6	69.9
No radon reducing features	62.1	89.3	165.5	316.9
Prefabricated Units (Panelized)				
With radon reducing features	0.0	0.0	0.0	0.0
No radon reducing features	0.0	0.0	0.0	0.0
Modular				
With radon reducing features	0.0	0.0	0.0	0.0
No radon reducing features	0.0	0.0	0.0	0.0
ALL Dwellings				
With radon reducing features	38.3	24.9	6.6	69.9
No radon reducing features	62.1	89.3	165.5	316.9
TOTAL -- ALL DWELLINGS	100.4	114.2	172.1	386.7
SIZE OF BUILDER				
DWELLINGS WITH RADON REDUCING FEATURES				
One to Ten Dwellings Per Year				
With radon reducing features	20.7	8.6	3.6	32.9
No radon reducing features	34.8	44.5	65.3	144.7
Eleven To Twenty-Five Dwellings Per Year				
With radon reducing features	8.8	2.8	0.0	11.6
No radon reducing features	11.4	9.5	25.4	46.3
Twenty-Six To 100 Dwellings Per Year				
With radon reducing features	6.0	8.2	2.9	17.1
No radon reducing features	9.6	28.4	33.8	71.8
Over 100 Dwellings Per Year				
With radon reducing features	2.6	5.2	0.0	7.8
No radon reducing features	6.1	6.3	36.2	48.6

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
<i>All Data in Thousands</i>				
METHODS EMPLOYED TO REDUCE RADON -- EXCEPT PIERS				
Dwellings With Basements				
Rough-in for subslab ventilation	18.2	11.6	3.5	33.3
Passive stack subslab ventilation	25.7	19.3	0.7	45.7
Fan-driven subslab depressurization	4.4	2.8	0.7	8.0
Only sealed entry routes	14.3	13.9	7.7	35.9
None	15.8	18.2	4.1	38.0
SUBTOTAL -- BASEMENTS	78.5	65.9	16.6	160.9
Dwellings With Crawl Spaces				
Passive stack subslab ventilation	3.6	0.7	0.6	5.0
Fan-driven (active) ventilation	0.5	0.1	0.5	1.0
Foundation Wall Vents	3.7	3.0	2.7	9.4
None	5.3	11.2	18.5	35.0
SUBTOTAL -- CRAWL SPACES	13.1	14.9	22.3	50.3
Dwellings With Slabs				
Rough-in for subslab ventilation	0.4	0.5	0.2	1.1
Passive stack subslab ventilation	3.5	1.7	4.0	9.2
Fan-driven subslab depressurization	0.4	0.2	0.0	0.6
Only sealed entry routes	2.7	16.7	62.1	81.5
None	1.6	13.6	62.0	77.2
SUBTOTAL -- SLABS	8.5	32.7	128.4	169.6
TOTAL	100.2	113.5	167.2	380.9
SEALING METHODS -- BASEMENTS				
(Multiple Answers Possible)				
Dwellings With Basements				
Polyethylene or other membrane under slab	46.6	31.9	9.4	87.9
Membrane on foundation walls under slab	10.3	6.3	1.3	18.0
Caulk around slab, wall openings & joints	19.8	16.4	2.2	38.5
Seal interior of foundation walls	6.5	6.9	1.2	14.6
Locate sump access outside of basement	0.2	1.1	0.2	1.6
Install air tight sump pit covers	19.0	17.0	1.2	37.2
Other	0.1	0.0	0.5	0.6
None	23.1	24.4	6.0	53.6
SEALING METHODS -- SLABS				
(Multiple Answers Possible)				
Dwellings With Slabs				
Polyethylene or other membrane under slab	6.1	15.0	52.8	75.8
Membrane on foundation walls under slab	1.4	2.5	7.3	14.5
Caulk around slab, wall openings & joints	1.9	4.5	16.3	27.0
Seal interior of foundation walls	0.1	0.7	9.0	6.3
Locate sump access outside of basement	0.1	0.1	0.1	0.9
Install air tight sump pit covers	1.8	0.4	0.0	9.4
Other	0.0	0.0	0.0	0.0
None	1.7	13.7	62.1	67.6

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
<i>All Data in Thousands</i>				
SUBSLAB PREPARATION -- BASEMENTS & SLABS				
(Multiple Answers Possible)				
Dwellings On Basements And Slabs				
Crushed aggregate 4" or more deep	71.4	69.3	37.2	177.9
Crushed aggregate less than 4" deep	6.9	7.8	6.8	21.5
Sand	9.5	29.2	89.3	127.9
Strips of geotextile drainage mat	2.9	1.7	2.1	6.8
Sheets of rigid foam insulation	28.7	28.1	18.1	74.8
Perforated plastic pipe	42.7	33.0	8.9	84.6
Plastic sheet (vapor barrier)	63.6	64.5	94.4	222.4
Other	3.1	9.3	6.7	19.1
None	8.4	6.7	12.7	27.8
SUBSLAB PREPARATION -- BASEMENTS				
(Multiple Answers Possible)				
Dwellings On Basements				
Crushed aggregate 4" or more deep	63.4	56.1	11.6	131.0
Crushed aggregate less than 4" deep	6.7	3.1	0.3	10.1
Sand	8.0	7.8	4.8	20.7
Strips of geotextile drainage mat	2.8	1.7	1.1	5.6
Sheets of rigid foam insulation	23.7	24.9	6.1	54.8
Perforated plastic pipe	39.1	27.8	6.5	73.4
Plastic sheet (vapor barrier)	57.4	40.9	9.6	107.9
Other	2.9	8.3	0.5	11.7
None	7.8	5.4	3.6	16.8
SUBSLAB PREPARATION -- SLABS				
(Multiple Answers Possible)				
Dwellings On Slabs				
Crushed aggregate 4" or more deep	8.0	13.2	25.6	46.9
Crushed aggregate less than 4" deep	0.3	4.8	6.4	11.5
Sand	1.5	21.3	84.5	107.3
Strips of geotextile drainage mat	0.2	0.1	1.0	1.2
Sheets of rigid foam insulation	5.0	3.1	11.9	20.1
Perforated plastic pipe	3.7	5.2	2.4	11.3
Plastic sheet (vapor barrier)	6.2	23.6	84.8	114.5
Other	0.2	1.0	6.2	7.4
None	0.6	1.3	9.1	11.0

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
<i>All Data in Thousands</i>				
COST OF PASSIVE SUB-SLAB VENTILATION				
Dwellings				
Less than \$200	12.8	6.2	2.7	21.7
\$200 to \$299	9.8	4.6	1.0	15.4
\$300 to \$399	5.0	4.5	0.8	10.3
\$400 to \$499	2.1	1.8	0.2	4.0
\$500 to \$599	1.3	3.0	0.5	4.8
\$600 to \$799	0.4	0.2	0.0	0.5
\$800 or greater	1.5	1.5	0.1	3.0
TOTAL	32.9	21.7	5.3	59.8
COST OF ACTIVE SUB-SLAB VENTILATION				
Dwellings				
Less than \$450	1.1	0.7	0.7	2.5
\$450 to \$549	1.0	0.7	0.0	1.6
\$550 to \$649	0.6	0.5	0.3	1.4
\$650 to \$749	0.3	0.5	0.1	0.9
\$750 to \$849	1.0	0.1	0.0	1.1
\$850 to \$1049	1.0	0.3	0.0	1.3
\$1050 or greater	0.4	0.4	0.0	0.8
TOTAL	5.3	3.1	1.2	9.6

APPENDIX G

TOTAL PRODUCT USAGE TABLES

FOR ALL HOUSES

BY THE THREE RADON EXPOSURE ZONES

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
<i>All Data in Thousands</i>				
HOUSING STARTS				
Single-Family Detached	100.4	114.2	172.1	386.7
Townhouses and Apartments	54.6	66.9	101.8	223.4
TOTAL HOUSING STARTS (Excluding HUD Code)	155.0	181.2	273.9	610.1
TYPE OF HOUSE: WITH RADON REDUCING FEATURES				
One Story Dwellings With Basements				
With radon reducing features	15.9	9.8	1.5	27.2
No radon reducing features	38.6	25.8	13.3	77.7
One story Dwellings With Crawl Spaces				
With radon reducing features	2.4	0.5	0.5	3.4
No radon reducing features	7.4	10.2	14.9	32.5
One Story Dwellings On Slabs				
With radon reducing features	4.0	3.2	3.0	10.2
No radon reducing features	12.1	35.9	117.7	165.7
Two Story Dwellings With Basements				
With radon reducing features	23.8	12.4	2.6	38.7
No radon reducing features	25.4	23.8	16.7	65.9
Two Story Dwellings With Crawl Spaces				
With radon reducing features	1.9	0.2	0.6	2.8
No radon reducing features	3.5	9.6	11.1	24.2
Two Story Dwellings On Slabs				
With radon reducing features	5.4	1.8	1.8	9.0
No radon reducing features	6.1	17.7	59.6	83.5
Three Story Dwellings With Basements				
With radon reducing features	0.7	0.9	1.4	2.9
No radon reducing features	4.0	1.8	5.7	11.5
Three Story Dwellings With Crawl Spaces				
With radon reducing features	0.0	0.0	0.0	0.0
No radon reducing features	0.1	3.0	0.7	3.8
Three Story Dwellings On Slabs				
With radon reducing features	0.2	6.5	0.0	6.8
No radon reducing features	3.1	8.4	14.8	26.3
Houses on piers	0.2	9.6	8.0	17.8
TOTAL	155.0	181.2	273.9	610.1
TYPE OF FOUNDATION -- EXCEPT PIERS				
Basements				
With radon reducing features	40.4	23.0	5.4	68.8
No radon reducing features	68.1	51.4	35.8	155.2
Crawl Spaces				
With radon reducing features	4.3	0.8	1.1	6.2
No radon reducing features	11.0	22.8	26.7	60.5
Slabs on Grade				
With radon reducing features	9.6	11.5	4.8	26.0
No radon reducing features	21.3	62.1	192.2	275.6
TOTAL	154.7	171.6	266.0	592.3
ALL DWELLINGS -- EXCEPT ON PIERS				
With radon reducing features	54.3	35.3	11.3	101.0
No radon reducing features	100.4	136.2	254.6	491.3
TOTAL -- ALL DWELLINGS	154.7	171.6	266.0	592.3

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
<i>All Data in Thousands</i>				
TESTING OF DWELLINGS				
All Units				
Tested For Radon Levels	30.2	19.0	13.8	63.0
Tested Units Needing More Work	7.7	2.8	0.4	10.9
Units With Basements				
Tested For Radon Levels	30.9	36.7	31.6	99.2
Tested Units Needing More Work	9.5	6.0	3.9	19.3
Units With Crawl Spaces				
Tested For Radon Levels	28.9	11.4	10.1	50.4
Tested Units Needing More Work	1.4	0.6	0.3	2.2
Units With Slabs				
Tested For Radon Levels	21.6	5.3	9.4	36.3
Tested Units Needing More Work	2.4	0.5	0.0	2.9
CONSTRUCTION METHOD				
DWELLINGS WITH RADON REDUCING FEATURES				
Conventional Constructed On Site				
With radon reducing features	54.4	37.1	11.7	103.2
No radon reducing features	100.6	144.1	262.2	506.9
Prefabricated Units (Panelized)				
With radon reducing features	0.0	0.0	0.0	0.0
No radon reducing features	0.0	0.0	0.0	0.0
Modular				
With radon reducing features	0.0	0.0	0.0	0.0
No radon reducing features	0.0	0.0	0.0	0.0
ALL Dwellings				
With radon reducing features	54.4	37.1	11.7	103.2
No radon reducing features	100.6	144.1	262.2	506.9
TOTAL -- ALL DWELLINGS	155.0	181.2	273.9	610.1
SIZE OF BUILDER				
DWELLINGS WITH RADON REDUCING FEATURES				
One to Ten Dwellings Per Year				
With radon reducing features	26.2	9.9	4.4	40.5
No radon reducing features	38.0	51.2	75.8	164.9
Eleven To Twenty-Five Dwellings Per Year				
With radon reducing features	17.2	2.8	0.0	20.1
No radon reducing features	26.2	16.2	41.5	83.9
Twenty-Six To 100 Dwellings Per Year				
With radon reducing features	8.3	8.5	6.9	23.7
No radon reducing features	22.0	47.0	85.6	154.6
Over 100 Dwellings Per Year				
With radon reducing features	2.6	14.1	0.0	16.7
No radon reducing features	14.2	22.0	51.8	88.0

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
<i>All Data in Thousands</i>				
METHODS EMPLOYED TO REDUCE RADON				
Dwellings With Basements				
Rough-in for subslab ventilation	25.1	14.1	3.5	39.7
Passive stack subslab ventilation	32.6	19.9	4.8	50.9
Fan-driven subslab depressurization	7.8	3.1	0.7	14.0
Only sealed entry routes	15.0	15.7	9.4	40.1
None	28.0	21.5	22.9	66.1
SUBTOTAL -- BASEMENTS	108.5	74.4	41.2	210.9
Dwellings With Crawl Spaces				
Passive stack subslab ventilation	3.8	0.7	0.6	6.3
Fan-driven (active) ventilation	0.5	0.1	0.5	1.5
Foundation Wall Vents	4.5	8.4	3.9	17.6
None	6.5	14.4	22.8	48.3
SUBTOTAL -- CRAWL SPACES	15.3	23.6	27.8	73.8
Dwellings With Slabs				
Rough-in for subslab ventilation	6.5	7.7	0.2	17.4
Passive stack subslab ventilation	7.7	10.6	4.8	26.4
Fan-driven subslab depressurization	1.9	0.9	0.0	4.6
Only sealed entry routes	8.2	28.9	88.6	125.0
None	6.7	25.5	103.4	133.0
SUBTOTAL -- SLABS	30.9	73.6	197.0	306.4
TOTAL	154.7	171.6	266.0	592.3
SEALING METHODS -- BASEMENTS				
(Multiple Answers Possible)				
Dwellings With Basements				
Polyethylene or other membrane under slab	59.5	35.5	15.7	110.6
Membrane on foundation walls under slab	14.4	7.8	5.6	27.8
Caulk around slab, wall openings & joints	24.6	19.0	6.5	50.1
Seal interior of foundation walls	7.0	8.7	1.2	16.9
Locate sump access outside of basement	0.2	1.2	0.2	1.6
Install air tight sump pit covers	24.8	17.7	5.5	48.0
Other	0.1	0.0	0.5	0.6
None	38.1	29.2	25.5	92.8
SEALING METHODS -- SLABS				
(Multiple Answers Possible)				
Dwellings With Slabs				
Polyethylene or other membrane under slab	18.8	32.0	82.4	133.3
Membrane on foundation walls under slab	4.6	5.2	7.5	17.4
Caulk around slab, wall openings & joints	10.4	10.0	27.7	48.0
Seal interior of foundation walls	0.1	2.5	14.6	17.3
Locate sump access outside of basement	0.1	0.1	0.1	0.3
Install air tight sump pit covers	10.2	12.7	0.0	22.9
Other	0.0	0.0	0.0	0.0
None	8.1	28.4	106.6	143.1

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
<i>All Data in Thousands</i>				
SUBSLAB PREPARATION -- BASEMENTS & SLABS				
(Multiple Answers Possible)				
Dwellings On Basements And Slabs				
Crushed aggregate 4" or more deep	115.0	110.9	88.3	314.2
Crushed aggregate less than 4" deep	11.8	11.7	9.0	32.5
Sand	12.1	49.7	134.5	196.3
Strips of geotextile drainage mat	2.9	2.3	6.3	11.5
Sheets of rigid foam insulation	49.9	60.3	34.6	144.8
Perforated plastic pipe	64.3	44.2	18.3	126.8
Plastic sheet (vapor barrier)	93.9	98.1	143.9	335.9
Other	4.6	9.4	23.7	37.7
None	16.1	11.8	32.9	60.9
SUBSLAB PREPARATION -- BASEMENTS				
(Multiple Answers Possible)				
Dwellings On Basements				
Crushed aggregate 4" or more deep	88.0	64.0	32.9	184.9
Crushed aggregate less than 4" deep	8.2	3.4	0.3	12.0
Sand	9.2	9.4	11.1	29.7
Strips of geotextile drainage mat	2.8	1.7	5.2	9.7
Sheets of rigid foam insulation	32.2	27.9	14.6	74.7
Perforated plastic pipe	52.4	31.0	15.0	98.4
Plastic sheet (vapor barrier)	70.7	46.5	20.3	137.4
Other	3.7	8.5	3.5	15.6
None	12.9	7.3	18.5	38.8
SUBSLAB PREPARATION -- SLABS				
(Multiple Answers Possible)				
Dwellings On Slabs				
Crushed aggregate 4" or more deep	27.1	46.9	55.3	129.3
Crushed aggregate less than 4" deep	3.6	8.3	8.7	20.6
Sand	2.9	40.3	123.4	166.6
Strips of geotextile drainage mat	0.2	0.6	1.0	1.8
Sheets of rigid foam insulation	17.7	32.4	20.0	70.1
Perforated plastic pipe	11.9	13.2	3.3	28.4
Plastic sheet (vapor barrier)	23.2	51.7	123.6	198.5
Other	0.9	1.0	20.2	22.1
None	3.2	4.5	14.4	22.1

	ZONE 1	ZONE 2	ZONE 3	US TOTAL
<i>All Data in Thousands</i>				
COST OF PASSIVE SUB-SLAB VENTILATION				
Dwellings				
Less than \$200	17.9	6.8	5.0	29.7
\$200 to \$299	13.1	9.7	3.2	26.0
\$300 to \$399	6.3	4.5	0.8	11.6
\$400 to \$499	2.9	2.5	0.2	5.5
\$500 to \$599	1.9	6.0	0.9	8.8
\$600 to \$799	0.4	0.2	0.0	0.5
\$800 or greater	1.7	1.6	0.1	3.4
TOTAL	44.2	31.3	10.2	85.6
COST OF ACTIVE SUB-SLAB VENTILATION				
Dwellings				
Less than \$450	3.8	0.8	0.7	5.3
\$450 to \$549	1.5	0.7	0.0	2.2
\$550 to \$649	1.0	0.9	0.3	2.2
\$650 to \$749	0.4	0.9	0.1	1.4
\$750 to \$849	1.1	0.1	0.0	1.2
\$850 to \$1049	1.8	0.3	0.0	2.1
\$1050 or greater	0.6	0.5	0.0	1.1
TOTAL	10.2	4.2	1.2	15.6

APPENDIX H

ANNUAL BUILDER PRACTICES QUESTIONNAIRE

2011

Builder Practices Survey

December 19, 2011

Dear Home Builder:

Your opinion matters, now more than ever. With the current challenges confronting the industry, building product manufacturers really need to know what products and materials you are using so they can determine the best mix of products to bring to you in the future.

For more than 20 years, the NAHB Research Center has relied upon professionals like you to help us understand the building product and material market. Our data is often used by product manufacturers as the foundation for research and analysis that determines what products to develop and what products to scrap. By completing our questionnaire, you can play a direct role in determining what products will be available to you as soon as next year.

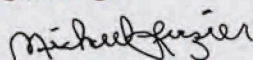
Don't be put-off by the length of the survey - it's not as complicated as it might seem. We're not asking for a detailed accounting of the products you use, just your best estimate.

Your information will be kept strictly confidential - your name and contact information will not be provided to anyone.

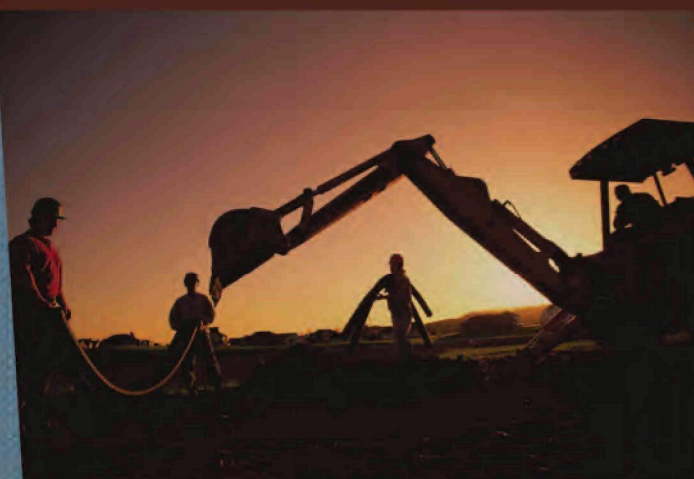
If you have any questions or want to suggest other builders who might complete a questionnaire, please contact Joanne McAlpin at 800-638-8556, ext. 6306, or send an email to jmcalpin@nahbrc.com.

Thank you in advance for your assistance.

Sincerely,



Michael Luzier
President, NAHB Research Center



Respondents who complete and return the survey will receive their choice of one of the following gift. (Please check ONE)

- ☐ Navy Full-Zip Hooded Sweatshirt (M)
- ☐ Navy Full-Zip Hooded Sweatshirt (L)
- ☐ Navy Full-Zip Hooded Sweatshirt (XL)
- ☐ Navy Full-Zip Hooded Sweatshirt (2X)
- ☐ Navy Full-Zip Hooded Sweatshirt (3X)

- ☐ Blue Dress Shirt (M)
- ☐ Blue Dress Shirt (L)
- ☐ Blue Dress Shirt (XL)
- ☐ Blue Dress Shirt (2X)
- ☐ Blue Dress Shirt (3X)



400 Prince George's Blvd
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www.nahbrc.com

Your firm is eligible to participate if it completed any single-family homes or multifamily units in 2011.

Fill in the numbers or percentages, or check the appropriate boxes, to indicate the materials and specifications of the houses your local building operations **completed in 2011**. If you don't know the exact answer, use thoughtful estimates.

Remember – you only need to answer for the types of houses you built in 2011. Please be assured that information about your firm will remain confidential. Thank you for your support!

Please call Joanne McAlpin at (800) 638-8556, extension 6306 if you need assistance in filling out this survey.

Houses built for one family that do not share any common walls or structural systems with other houses.

Townhouses or duplexes that share at least one common wall with another house, but each house rests on its own foundation.

Dwellings in buildings that share a common foundation and usually some common walls.

Country: USA State: 1 County / Parish: 2 Email: 2a

	SFD STARTER	SFD MOVE-UP	SFD LUXURY	SFA TOWNHOUSE/DUPLEX	MF MULTIFAMILY
Number of houses (or living units)	_____ 3	_____ 26	_____ 49	_____ 72	_____ 92
Average square feet (sf) above-grade ...	_____ <i>sf</i> 4	_____ <i>sf</i> 27	_____ <i>sf</i> 50	_____ <i>sf</i> 73	_____ <i>sf</i> 93 (<i>sf Per UNIT</i>)
Finished sf typical basement	_____ <i>sf</i> 5	_____ <i>sf</i> 28	_____ <i>sf</i> 51	_____ <i>sf</i> 74	
Average selling price	\$ _____ 6	\$ _____ 29	\$ _____ 52	\$ _____ 75	\$ _____ 94 (<i>\$ Per UNIT</i>)
Typical lot size (sf or acres)	_____ 7	_____ 30	_____ 53	_____ 76	
Number of Multifamily Buildings your firm constructed (not living units) ➡ ➡ Multifamily Buildings ➡ ➡					_____ 95

How many homes did your firm construct with the following foundation types?

	SFD STARTER # HOUSES ↓	SFD MOVE-UP # HOUSES ↓	SFD LUXURY # HOUSES ↓	SFA TOWNHOUSE/DUPLEX # UNITS ↓	MF MULTIFAMILY # BUILDINGS ↓
Full basement	9	32	55	78	96
Partial basement & crawl space	10	33	56	79	97
Partial basement & slab	11	34	57	80	98
Crawl space, continuous wall	12	35	58	81	99
Concrete slab on grade or pilings	13	36	59	82	100
Piers or raised pilings	14	37	60	83	101

Do not include basement living areas ***except*** in Multifamily buildings.

	SFD STARTER # HOUSES ↓	SFD MOVE-UP # HOUSES ↓	SFD LUXURY # HOUSES ↓	SFA TOWNHOUSE/DUPLEX # UNITS ↓	MF MULTIFAMILY # BUILDINGS ↓
One or 1½ (include split levels)	_____ 15	_____ 38	_____ 61	_____ 84	_____ 101a
Two or 2½	_____ 16	_____ 39	_____ 62	_____ 85	_____ 102
Three or 3½	_____ 17	_____ 40	_____ 63	_____ 86	_____ 103
Four or more stories ➡				_____ 87	_____ 104

GARAGES AND CARPORTS

	SFD STARTER # HOUSES ↓	SFD MOVE-UP # HOUSES ↓	SFD LUXURY # HOUSES ↓	SFA TOWNHOUSE/DUPLEX # UNITS ↓	MF MULTIFAMILY # UNITS ↓
1 Car Garage	18	41	64	766	773
2 Car Garage	19	42	65	767	774
3 or more Car Garage	20	43	66	767a	774a
1 Car Carport	20a	43a	66a	768	775
2 or more Car Carport	20b	43b	66b	769	776
No Garage or Carport	21	44	67	769a	776a

NUMBER OF ROOMS

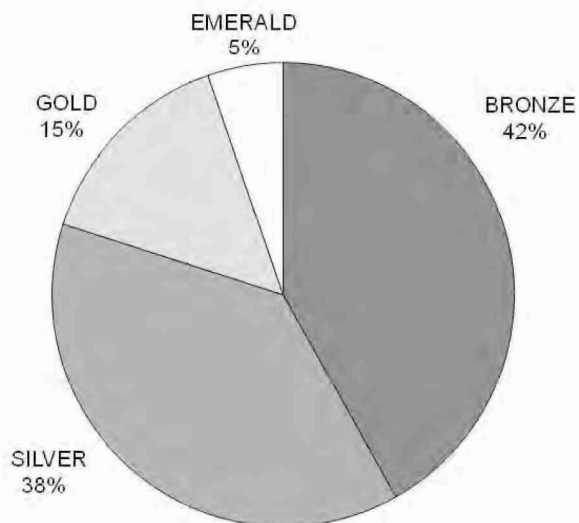
	SFD STARTER # ROOMS PER HOUSE ↓	SFD MOVE-UP # ROOMS PER HOUSE ↓	SFD LUXURY # ROOMS PER HOUSE ↓	SFA TOWNHOUSE/DUPLEX # ROOMS PER UNIT ↓	MF MULTIFAMILY # ROOMS PER UNIT ↓
Bedroom(s)	22	45	68	88	105
Half Bathroom(s)	23a	46a	69a	89a	106a
Full or ¾ Bathroom(s)	23	46	69	89	106
Total Rooms (Exclude Bathrooms)	24	47	70	90	107
Closets (Include Coat / Linen / Pantry)	25	48	71	91	108

SUBSLAB PREPARATION

What did you place under your concrete slab floors for your living areas?

	SLAB- ON-GRADE	BASEMENT SLAB
(✓ all you use)		
4" or greater layer of stone or gravel	[] 121_1	[] 121_2
Less than 4" layer of stone or gravel	[] 122_1	[] 122_2
Sand	[] 122c_1	[] 122c_2
Strips or layers of geotextile drainage mat	[] 123_1	[] 123_2
Rigid foam insulation	[] 124_1	[] 124_2
Perforated plastic pipe	[] 125_1	[] 125_2
Plastic sheet	[] 125c_1	[] 125c_2
Other _____ (PLEASE SPECIFY)	[] 126_1	[] 126_2
Nothing under slab	[] 127_1	[] 127_2

2010 Certification Levels National Green Building Standard



BASEMENT / CRAWL SPACE WALL MATERIAL

What **percent** of your homes or multifamily **buildings** had basement or crawlspace walls made of the following materials?

Do not include brick veneer.

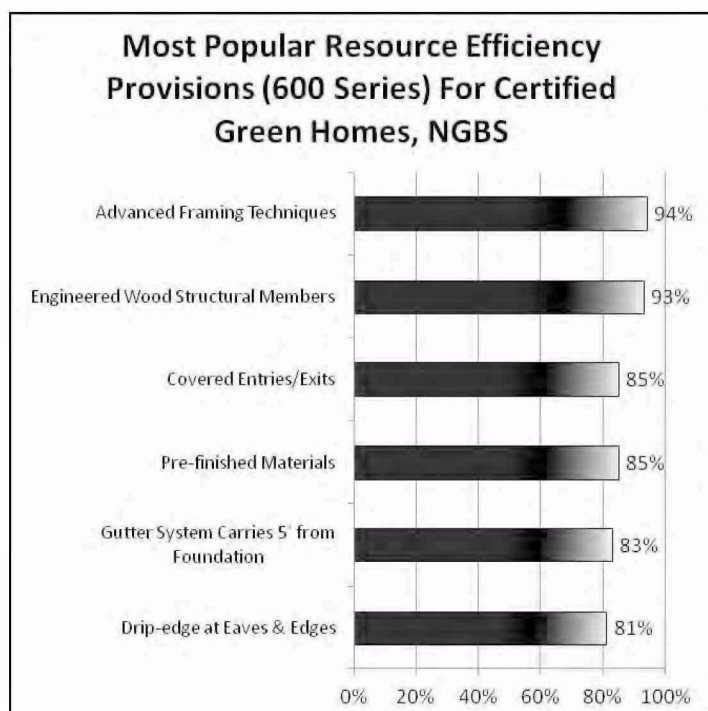
	SFD HOUSES	SFA UNITS	MF BUILDINGS
Poured concrete, reusable forms	109	109a	109b
Concrete block (CMU)	110	110a	110b
Precast concrete (e.g., Superior Walls®)	111	111a	111b
Insulated Concrete Forms (ICFs)	112	112a	112b
Pressure treated wood	113	113a	113b
Other (PLEASE SPECIFY)	114	114a	114b
	100%	100%	100%

ABOVE-GRADE STRUCTURAL WALLS

What **percent** of your homes' **above-grade** exterior walls had the following as a **primary** structural material?

Do not include foundation walls or brick veneer finish.

	FIRST STORY	UPPER STORIES
Concrete or masonry	128	131
Wood (all types)	129	132
Steel (all types)	130	133
	100%	100%



TYPE OF WOOD WALL STUDS

What is the most common type or species of wood for your **wall studs**? (**✓one**)

Southern yellow pine (SYP)	[]	1
Douglas fir	[]	2
Hem-fir or other western woods	[]	3
Spruce / Pine / Fir (SPF) or eastern spruce	[]	4
LSL (laminated strand lumber, Timberstrand®, SolidStart®, etc)	[]	5
LVL (laminated veneer lumber)	[]	6
Don't know	[]	7
Other (PLEASE SPECIFY)	[]	8 145

What **percent** of your wood **wall studs** were:

Preservative treated	n145a
Finger jointed (any species)	n145b

CONCRETE & MASONRY ABOVE-GRADE WALLS

If any of your homes had concrete or masonry **above-grade** walls, what **percent** were each of the following types?

Do not include basement walls or brick veneer finish.

Poured concrete, reusable/temporary forms	146
Concrete block (CMU)	147
Precast concrete (e.g., Superior Walls®)	148
Insulated Concrete Forms (ICFs)	149
Autoclaved aerated concrete (AAC)	150
Other concrete or masonry (PLEASE SPECIFY)	152 100%

LIGHT-FRAME EXTERIOR WALL DEPTH & SPACING

What **percent** of all your exterior light-frame walls were:

	WOOD	STEEL
2x4s at 16" o.c.	140	140a
2x4s at 24" o.c.	141	141a
2x6s at 16" o.c.	142	142a
2x6s at 24" o.c.	143	143a
Other (PLEASE SPECIFY)	144 100%	144a 100%

INTERIOR WALLS

What **percent** of all your interior walls were:

Masonry or concrete	522
Steel (all spacing)	521a
Lumber: 2x3s at 16" o.c.	515
Lumber: 2x3s at 24" o.c.	516
Lumber: 2x4s at 16" o.c.	517
Lumber: 2x4s at 24" o.c.	518
Lumber: 2x6s at 16" o.c.	519
Lumber: 2x6s at 24" o.c.	520
Lumber: Other dimensions / spacing	520a
	100%

WALL HEADERS: WINDOWS, DOORS, AND FIREPLACES

What **percent** of the (1) single window, door, and fireplace openings, (2) multiple window and door openings, and (3) garage door openings were spanned by headers of the following materials?

	SINGLE Window / Door / Fireplace Headers	MULTIPLE Window / Door Headers	Garage Door Headers
Built-up dimensional lumber	153	153a	167
Solid wood (4xs, etc.)	154	154a	168
Glulam	155	155a	169
Wood I-joists used singly ...	156	156a	170
Wood I-joists doubled	157	157a	171
LVL single	158	158a	172
LVL doubled	159	159a	173
Parallam®	160	160a	174
Concrete	161	161a	175
Steel (all types)	162	162a	176
Glued & nailed box headers	163	163a	177
Wood truss	164	164a	178
LSL (laminated strand lumber, Timberstrand®, SolidStart®, etc)	165	165a	179
Fitch plate beams (lumber with steel plate, bolted)	166	166a	180
	100%	100%	100%

EXTERIOR WALL SHEATHING

Please consider "sheathing" to be the panel product that is fastened directly to wall studs. What **percent** of your total exterior wall area was sheathed with:

NONE (SIPs, masonry, log walls, etc.)	182
Plywood, 3/8"	183
Plywood, 1/2"	184
Plywood, 5/8"	185
Plywood, 3/4"	186
ZIP Wall System® (Huber)	186a
OSB, 3/8"	187
OSB, 7/16"	188
OSB, 1/2"	188a
OSB, 5/8"	189
OSB, 3/4"	190
Fiberboard (Stedi-R®, Bildrite®, etc)	191
Gypsumboard (including Dens-Glass®, FibeRock®)	193
1/8" foil-faced 3-ply kraft paper (Thermo-ply®) ..	194
Dow SIS	195
Extruded polystyrene – XPS (blue Dow Styrofoam®, pink Owens Corning)	196
Expanded polystyrene – EPS, or "bead board"	197
Polyisocyanurate (Tuff-R®, Thermax®, R-Max®)	198
Other	199
	(PLEASE SPECIFY) 100%

TWO LAYERS OF EXTERIOR WALL SHEATHING

What **percent** of your homes had a layer of foam sheathing placed over a layer of structural sheathing material? **Do not include** layer of foam for EIFS finish. _____%

Check the most common material for second layer of foam:

1 ☐ XPS 2 ☐ EPS 3 ☐ Polyisocyanurate
181a

THICKNESS OF FOAM

What was the **typical thickness** of the foam you used? (✓ one)

1 ☐ 1/2" 4 ☐ 1-1/2"
2 ☐ 5/8 or 3/4" 5 ☐ 2" or greater
3 ☐ 1" 200

What percentage of your homes are fully sheathed with either plywood or OSB? _____ 2025

MATERIAL OF STRUCTURAL FLOOR SYSTEM

What **percent** of your structural floors in finished areas of your homes (exclude basement and garage floors) were:

	GROUND FLOOR	UPPER FLOORS
Cast-in-place concrete	212	216
Precast concrete	213	217
Wood or lumber	214	218
Steel (all types)	215	219
	100%	100%

DEPTH OF STRUCTURAL FLOOR

For each material you used, ✓ the **most common depth** of your floor framing:

	LUMBER JOISTS	WOOD I-JOISTS	OPEN-WEB JOISTS	STEEL JOISTS
8"	[]	[]	[]	[] ₁
10" (or 9-7/8")	[]	[]	[]	[] ₂
12" (or 11-7/8")	[]	[]	[]	[] ₃
14" or greater	[] 1033	[] 1034	[] 1035	[] ₄ 1035a

SPACING OF FLOOR FRAMING

What **percent** of your framed floor area had joists spaced at:

	LUMBER JOISTS	WOOD I-JOISTS	OPEN-WEB JOISTS	STEEL JOISTS
12" o.c.	1036	1042	1048	1048a
16" o.c.	1037	1043	1049	1049a
19.2" o.c.	1038	1044	1050	1050a
24" o.c.	1039	1045	1051	1051a
32" o.c.	1040	1046	1052	1052a
Other spacing	1041	1047	1053	1053a
	100%	100%	100%	100%

TYPE OF WOOD FLOOR FRAMING

What **percent** of your structural wood floors on ground and upper floors were:

Do not include **support beam, slabs, or concrete.**

	GROUND FLOOR	UPPER FLOORS
Lumber joists, solid wood	220	225
Wood I-joists	221	226
Open-web joists (wood floor truss)	222	227
Structural Insulated Panels (SIPs) ...	223	228
Other wood	224	229
	100%	100%

SPECIES OF WOOD FLOOR FRAMING

What species of dimensional lumber joist (**not** I-joists) did you **most commonly** use for your floor framing?

(✓one)

Southern yellow pine (SYP)	[] ₁
Douglas fir or hem-fir	[] ₂
Spruce / Pine / Fir (SPF), or eastern spruce	[] ₃
Treated lumber	[] ₄
Don't know	[] ₅
Other	[] ₆ 230
	(PLEASE SPECIFY)

FLOOR SHEATHING (SUBFLOORING)

What **percent** of your total floor area used each of the following sheathing (sub-flooring) materials?

	GROUND FLOOR	UPPER FLOORS
Concrete or SIPs	231	246
1/2" plywood	232	247
5/8" plywood	233	248
3/4" plywood	234	249
1-1/8" plywood	235	250
7/16" or 1/2" OSB	236	251
5/8" OSB	237	252
3/4" OSB	238	253
7/8" OSB	239	254
1" OSB	240	255
1-1/8" or thicker OSB	241	256
1x boards (3/4" actual, including T&G)	243	258
2x boards (1-1/2" actual, including T&G)	244	259
Other	245	260
	100%	100%
	(PLEASE SPECIFY)	

If you used OSB floor sheathing, what was the typical brand or type?

(✓one)

Generic or commodity	[] ₁
Advantech (Huber)	[] ₂
EdgeGold (Weyerhaeuser)	[] ₃
Pinnacle (Norboard)	[] ₄
Point Six (Durastrand)	[] ₅
TopNotch (LP)	[] ₆
Other	[] ₇ n230
	(PLEASE SPECIFY)

RIMBOARD FOR WOOD I-JOISTS

What **percent** of your **I-joist floor systems** used each of the following **rimboard** materials?

NO rimboard used (sheathing only)	1117h
LSL (laminated strand lumber, Timberstrand®, SolidStart®, etc.)	1117a
OSB (G-P Fiberstrong®, L-P Solid Start®, etc.)	1117b
Wood I-joists with blocking	1117c
Plywood	1117d
Dimensional lumber (2x10's, etc.)	1117e
LVL (laminated veneer lumber)	1117f
Re-sawn glulam	1117g
	100%

FLOOR BEAMS: SUPPORT, FLUSH, AND EDGE BEAMS

Floor beams may include 1) **support beams**, which provide a bearing point for floor joists, 2) **flush beams**, which provide support and are recessed into the floor, and 3) **edge beams** that typically support the edge of a loft or stairway (exclude rimboard).

About how many linear feet (LF) of floor beams did you use in a **typical** house or multifamily living unit?

	GROUND FLOOR	UPPER FLOORS
Single-family detached (SFD) floor beams: LF per HOUSE	LF ₁₀₆₁	LF ₁₀₆₄
Single-family attached (SFA) floor beams: LF per UNIT	LF _{1061a}	LF _{1064a}
Multifamily floor beams: LF per UNIT	LF ₁₀₆₂	LF ₁₀₆₅

FLOOR BEAM MATERIAL

What **percent** of your floor beams were:

	GROUND FLOOR	UPPER FLOORS
Built-up dimension lumber	1099	1108
Solid lumber (4x6 or greater)	1100	1109
Glulam	1101	1110
LVL	1102	1111
Parallam®	1103	1112
LSL (laminated strand lumber, Timberstrand®, SolidStart®, etc.)	1103a	1112a
Open-web Joist	1104	1113
Steel (all types)	1105	1114
I-Joist (multiple)	1106	1115
Other	1107	1116
(PLEASE SPECIFY)	100%	100%

ROOF BEAMS AND CEILING SUPPORT BEAMS

For a **typical** house or multifamily **building**, how many **linear feet (LF)** of roof beams (ridge, hip, and valley) and beams located on the ceiling assembly did you use?

Do not include wall headers that support roofs.

Single-family detached (SFD) roof beams	LF ₁₀₈₀
Single-family attached (SFA) roof beams ...	LF _{1080a}
Multifamily building roof beams	LF _{1080b}

What **percent** of your roof and ceiling assembly beams were:

Built-up dimensional lumber	1081
Solid lumber (4x6 or greater)	1082
Glulam	1083
LVL	1084
Parallam®	1085
LSL (laminated strand lumber, Timberstrand®, SolidStart®, etc.)	1085a
Girder truss	1086
Steel (all types)	1087
I-Joist (multiple)	1088
Other	1089
(PLEASE SPECIFY)	100%

ROOF FRAMING

What **percent** of the total roof area on your homes were the following shapes?

Gable	261
Hip	262
Gambrel	263
Flat	264a
Other	264
(PLEASE SPECIFY)	100%

TYPE OF ROOF FRAMING

What **percent** of your houses had roofs framed with:

Combination of trusses and rafters	270
Rafters only	268
Trusses only	269
Structural Insulated Panels (SIPs)	271
Beams and purlins	272
Other	273
(PLEASE SPECIFY)	100%

SPECIES OF ROOF FRAMING LUMBER

What **percent** of your dimensional lumber trusses or rafters / ceiling joists (**not** I-joists) were:

	TRUSSES	RAFTERS
Southern yellow pine (SYP)	280	285
Douglas fir or hem-fir	281	286
Spruce / Pine / Fir (SPF)	282	287
Treated lumber	282a	287a
Don't know	283	288
Other	284	289
(PLEASE SPECIFY)	100%	100%

RAFTER ROOFS

If you built with rafters, what **percent** of your rafters were:

Lumber	276
I-joists	277
Steel	278
	100%

TRUSS ROOFS

If you built with roof trusses, what **percent** of your trusses were:

Lumber (standard)	276a
Lumber (Raised Heel or Energy Truss)	276b
I-joists	277a
Steel	278a
	100%

CEILING TYPE

What **percent** of the ceiling area **directly under the roof** was:

Sloped (i.e., cathedral or vaulted)	296
Flat	297
	100%

ROOF PITCH

What **percent** of your roofs had pitches of:

Flat to 1/2 / 12"	290
1/2 / 12" to 4/12"	291
5/12" or 6/12"	292
7/12" or 8/12"	293
9/12" or 10/12"	294
11/12" or greater	295
	100%

ROOF VENTILATION

What **percent** of your homes and multifamily buildings had:

	SFD	SFA	MF BUILDINGS
Ridge vents	329	329a	329b
Roof vents – not powered	330	330a	330b
Wind turbine roof vents	331	331a	331b
Roof mounted attic fans	332	332a	332b
Gable wall louvers	333	333a	333b
Gable mounted attic fans	334	334a	334b
Whole house fans	335	335a	335b
Soffit vents	336	336a	336b
	Totals need not add to 100%		

ROOFING MATERIAL

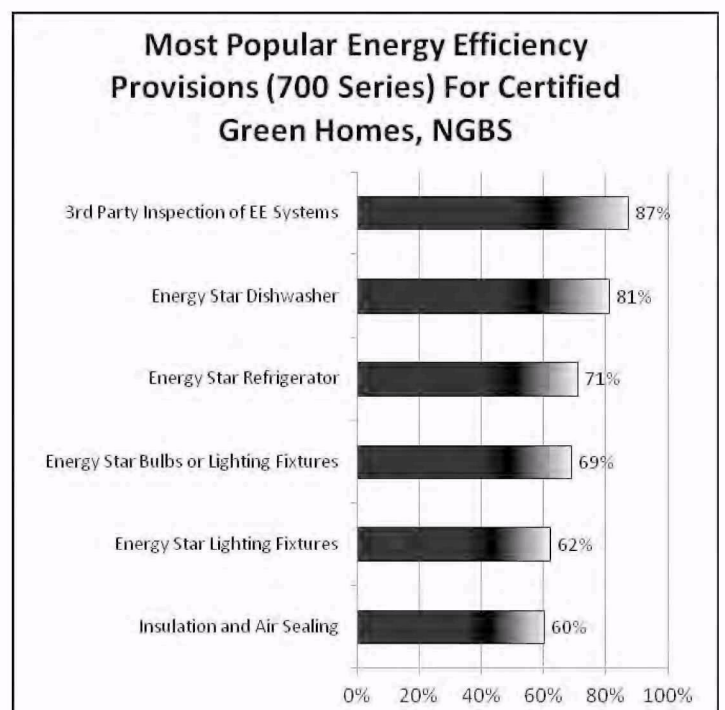
What **percent** of your total roof area was finished with:

Asphalt shingle, three tab, standard weight	310
Asphalt shingle, "Architectural" or laminated	311
Cedar shingles (sawn)	312
Cedar shakes (split)	313
Clay or ceramic roof tiles	315
Concrete roof tiles	316
Fiber cement shingles	317
Slate (natural)	318
Steel	319
Aluminum	320
Copper	314
Built-up roof (e.g., hot-mopped asphalt)	321
Single ply (EPDM, vinyl, modified bitumen)	322
Composite shingles (plastic or recycled rubber) ...	322b
Other	322a
(PLEASE SPECIFY)	100%

METAL ROOFING STYLE

If you used metal roofing, what **percent** of your metal roofing (exclude copper) was:

Metal shakes/shingles/tiles	310v
Standing seam/Vertical ribbed	311v
Corrugated	312v
Flat panel	313v
Granulated	322cv
Don't know	322bv
Other	322av
(PLEASE SPECIFY)	100%



ROOF SHEATHING

What **percent** of your total roof area was sheathed with:

NONE (roofing attached directly to framing, or SIPs) ..	_____	298
3/8" plywood	_____	299
1/2" plywood	_____	300
5/8" plywood	_____	301
3/4" plywood	_____	302
ZIP Roof System® (Huber)	_____	302a
7/16" OSB (including Radiant Barrier Sheathing)	_____	303
1/2" OSB (including Radiant Barrier Sheathing) ..	_____	303a
5/8" OSB (including Radiant Barrier Sheathing) ..	_____	304
3/4" OSB (including Radiant Barrier Sheathing) ..	_____	305
1"x boards (3/4" actual) – no spacing	_____	306
1"x boards (3/4" actual) – spaced	_____	307
2"x lumber (1-1/2" actual – including T&G)	_____	308
Other	_____	309
(PLEASE SPECIFY)		100%

SIDING / EXTERIOR FINISH MATERIAL

What **percent** of the total exterior wall area for all the homes you built, including garages and dormers, was finished (sided) with the following materials?

Wood-based Siding

Plywood panels (e.g., T-111)	_____	341
OSB (e.g., LP SmartSide®)	_____	345
Hardboard	_____	342
Cedar shingles (sawn) or shakes (split)	_____	344
Cedar boards	_____	343a
Redwood boards	_____	343b
Other wood boards	_____	343c
Other wood-based siding	_____	346
(PLEASE SPECIFY)		

Masonry and Cement Materials

Brick	_____	347
Natural stone	_____	348
Manufactured stone ("synthetic stone")	_____	349
Cement stucco	_____	350
Synthetic stucco or EIFS (e.g., Dryvit®, STO®)	_____	351
Architectural concrete block (split-face, etc.) ...	_____	352
Fiber cement siding (e.g., HardiePlank®, CertainTeed)	_____	353

Plastic & Metal Siding

Vinyl	_____	354
Aluminum	_____	355
Steel	_____	356

Other	_____	357
(PLEASE SPECIFY)		100%

SOFFIT, FASCIA, & EXTERIOR TRIM MATERIAL

What **percent** of your soffit, fascia, & exterior trim material was:

	SOFFIT	FASCIA	EXTERIOR TRIM
NO soffit or fascia installed	_____ 358	_____ 366	_____ 719
Cedar boards	_____ 359a	_____ 367a	_____ 720a
Redwood boards	_____ 359b	_____ 367b	_____ 720b
Other wood boards	_____ 359c	_____ 367c	_____ 720c
Plywood / LVL	_____ 360a	_____ 368a	_____ 721
OSB (LP SmartSide®)	_____ 362	_____ 370	_____ 723
Hardboard or Wood Fiber Composite	_____ 361	_____ 369	_____ 722
Stucco	_____ 363	_____ 371	_____ 723a
Vinyl (wrap for fascia)	_____ 364	_____ 372	_____ 723b
Aluminum (wrap for fascia)	_____ 365	_____ 373	_____ 723c
Steel	_____ 365b	_____ 373b	_____ 725
Fiber cement	_____ 365c	_____ 373c	_____ 725a
Cellular PVC (Azek®, Koma®, etc)	_____ 365e	_____ 373e	_____ 725c
Urethane	_____ 365d	_____ 373d	_____ 725b
Plastic composite (Trex®, etc)	_____ 365f	_____ 373f	_____ 725d
Other	_____ 365a	_____ 373a	_____ 724
(PLEASE SPECIFY)			
	100%	100%	100%

WINDOWS

AVERAGE WINDOW OPENINGS PER HOUSE

What was the **average number** of window **openings** (in the wall framing) in your typical house?

Exclude openings for doors and non-prime windows.

SFD Starter	SFD Move-up	SFD Luxury	SFA Per UNIT	MF Per UNIT
_____ 374a	_____ 374b	_____ 374c	_____ 375	_____ 376

AVERAGE WINDOW UNITS PER HOUSE

Considering that some window **openings** have more than one window **unit** per opening: how many window **units** were in your typical home?

Include both operable (venting) and fixed units.

Average number of window **units** per new home:

SFD Starter	SFD Move-up	SFD Luxury	SFA Per UNIT	MF Per UNIT
_____ 377a	_____ 377b	_____ 377c	_____ 378	_____ 379

GLAZING

What **percent** of your windows were:

Single glazed	_____ 422
Double glazed	_____ 423
Triple glazed or more	_____ 424
Heat-Mirror®	_____ 425
	100%

GLASS TYPE

What **type** of glass did your windows **most commonly** have?

Clear	_____ 426
Low-E	_____ 427
Gas filled (Argon, Krypton, etc)	_____ 427a
Tinted	_____ 428
Impact resistant	_____ 428a

Totals need not add to 100%

MATERIAL OF WINDOW FRAMES

What **percent** of all the window **units** you installed had the following frame material?

	SFD	SFA	MF UNITS
Wood (no cladding)	_____ 380	_____ 387	_____ 394
Wood, aluminum clad	_____ 381	_____ 388	_____ 395
Wood, vinyl clad	_____ 382	_____ 389	_____ 396
Aluminum	_____ 383	_____ 390	_____ 397
Vinyl	_____ 384	_____ 391	_____ 398
Composite	_____ 385	_____ 392	_____ 399
Other _____ (PLEASE SPECIFY)	_____ 386	_____ 393	_____ 400
	100%	100%	100%

WINDOW TYPE

What **percent** of all the window **units** you installed were:

	SFD	SFA	MF UNITS
Casement	_____ 401	_____ 408	_____ 415
Awning	_____ 402	_____ 409	_____ 416
Double hung	_____ 403	_____ 410	_____ 417
Single hung	_____ 404	_____ 411	_____ 418
Sliding (side-by-side)	_____ 405	_____ 412	_____ 419
Fixed, rectangular	_____ 406	_____ 413	_____ 420
Fixed, non-rectangular	_____ 407	_____ 414	_____ 421
Other _____ (PLEASE SPECIFY)	_____ 407a	_____ 414a	_____ 421a
	100%	100%	100%

SKYLIGHTS AND ROOF WINDOWS

How **many** skylights/roof windows did your **typical** house have?

	SFD	SFA	MF Per BUILDING
Skylights	_____ 323	_____ 325	_____ 327
Tubular Skylights	_____ 323a	_____ 325a	_____ 327a
Roof windows	_____ 324	_____ 326	_____ 328

EXTERIOR SHUTTERS

How **many PAIRS** of exterior shutters did your **typical** house have?

	SFD	SFA	MF Per UNIT
	_____ 731	_____ 731a	_____ 731b

What **percent** of the shutters were made of:

Wood (any type)	_____ 732	_____ 732a	_____ 732b
Plastic (including polyurethane and PVC)	_____ 733	_____ 733a	_____ 733b
Other	_____ 734	_____ 734a	_____ 734b
	100%	100%	100%

What **percent** of the shutters were of the following styles?

Raised panel	_____ 735	_____ 735a	_____ 735b
Louvered	_____ 736	_____ 736a	_____ 736b
Board and Batten	_____ 737	_____ 737a	_____ 737b
Other	_____ 738	_____ 738a	_____ 738b
	100%	100%	100%

PATIO DOORS

How many patio door **openings** did your typical house have?
Please include both sliding and hinged patio doors.

SFD Starter	SFD Move-up	SFD Luxury	SFA Per UNIT	MF Per UNIT
_____ 429a	_____ 429b	_____ 429c	_____ 430	_____ 431

PATIO DOOR TYPE

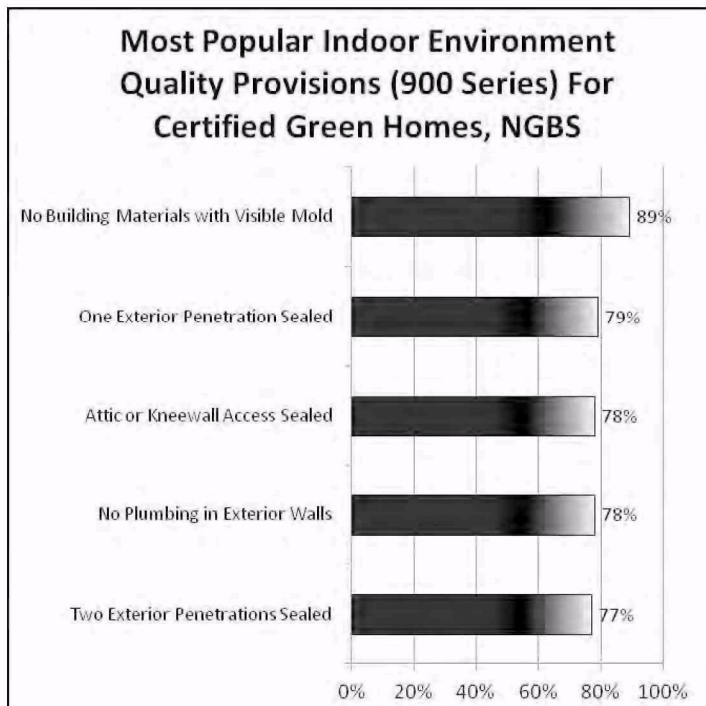
What **percent** of all your patio doors were:

	SFD	SFA	MF
Hinged/Swinging	_____ 432	_____ 434	_____ 436
Sliding	_____ 433	_____ 435	_____ 437
	100%	100%	100%

PATIO DOOR MATERIAL

What **percent** of all your patio doors were:

	<u>HINGED</u>	<u>SLIDING</u>
Wood (no cladding)	_____ 438	_____ 446
Wood, aluminum clad	_____ 439	_____ 447
Wood, vinyl clad	_____ 440	_____ 448
Steel	_____ 441	_____ 449
Aluminum	_____ 442	_____ 450
Vinyl	_____ 443	_____ 451
Composite (fiberglass, etc.)	_____ 444	_____ 452
Other _____ (PLEASE SPECIFY)	_____ 445	_____ 453
	100%	100%



EXTERIOR DOORS

How **many** exterior entry door **OPENINGS** were in your typical house?

Exclude patio doors.

SFD Starter	SFD Move-up	SFD Luxury	SFA Per UNIT	MF Per UNIT
_____ 454a	_____ 454b	_____ 454c	_____ 455	_____ 456

EXTERIOR DOOR MATERIAL

What **percent** of all your exterior doors were: (If glass, answer for frame material)

Exclude patio doors.

	FRONT	OTHER
Solid wood – raised panel	_____ 457	_____ 462
Wood – flush	_____ 458	_____ 463
Steel – raised panel	_____ 459	_____ 464
Steel – flush	_____ 460	_____ 465
Fiberglass	_____ 461	_____ 466
Other _____ (PLEASE SPECIFY)	_____ 461a	_____ 466a
	100%	100%

DOUBLE FRONT DOORS

What **percent** of your front doors were double doors? _____ 467

SIDELITES

What **percent** of your front doors had sidelites?

Sidelites on one side	_____ 468
Sidelites on both sides	_____ 469
NO sidelites	_____ 470
	100%

MULTIFAMILY COMMON ENTRY DOORS

In some multifamily buildings, the individual living units have entry doors opening directly to the outside. Other buildings have common entry doors opening to hallways leading to entry doors for the individual living units.

What **percent** of your multifamily buildings used common entry doors?

_____ 471a

Of the new multifamily buildings with common entry doors, **how many** common entry doors, including double doors, did a **typical** building have?

_____ 471b

DRIVEWAYS

The following questions deal **only** with **single-family** homes.

Percent of single-family homes with driveways .. _____ 777

Length (in feet) of typical driveway..... _____ 777_L

Width (in feet) of typical driveway _____ 777_W

What percent of your driveway surfaces were made of:

Asphalt _____ 778

Poured concrete (including stamped/stenciled) ... _____ 779

Brick paver _____ 780

Concrete paver _____ 781

Gravel or crushed stone w/ parking pad _____ 782

Gravel or crushed stone w/ **no** parking pad _____ 783

Other _____ (PLEASE SPECIFY) _____ 784

100%

GARAGE DOOR CONFIGURATIONS

What percent of your garages had the following types of doors?

One single-wide door _____ 750a

One double-wide door _____ 750

Two single-wide doors _____ 751

One double-wide door, one single-wide door _____ 752

Three single-wide doors..... _____ 753

Other configuration _____ (PLEASE SPECIFY) _____ 753a

100%

GARAGE DOOR OPTIONS

What percent of your garage doors were the following types?

Sectional _____ 739

One-piece (canopy or retractable)..... _____ 740

Side-hinged _____ 741

Other _____ 742

100%

What percent of your garage doors were the following materials?

Steel _____ 754

Wood _____ 755

Fiberglass or Plastic _____ 756

Other _____ 757

100%

What percent of your garage doors had openers? .. _____ 745

FINISHED FLOORING TYPE

*What type of flooring do you **most commonly** install in the following rooms?*

(✓ only one box per row)	Wall-to-Wall Carpet	Hardwood (solid)	Hardwood (engineered)	Vinyl Sheet	Vinyl Tile	Laminate	Ceramic Tile	Slate	Marble	Other	
	1	2	3	4	5	6	7	8	9	10	
Entry foyer (✓one)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	642
Living room (✓one)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	643
Dining room (✓one)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	644
Family room, den, rec room (✓one) ..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	645
Kitchen (✓one)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	646
Bedrooms (✓one)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	647
Half bathrooms (✓one)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	648
Full bathrooms (✓one)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	649
Hallway (✓one)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	651
Finished basement (✓one)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	651a

INSULATION

FLAT CEILINGS / ATTIC INSULATION MATERIAL

What **percent** of your total **flat** ceiling areas (e.g., attics) were insulated with the following materials, and what was the typical R-value?

	% FLAT CEILINGS INSULATED	R-VALUE
NOT insulated	820	
Fiberglass batt and blown	812	812r
Fiberglass batt	813	813r
Fiberglass blown	814	814r
Rockwool batt	815	815r
Rockwool blown	816	816r
Cellulose blown	817	817r
Spray foam	818	818r
Foam board	822	822r
Other _____ (PLEASE SPECIFY)	819	819r
100%		

SLAB-ON-GRADE FOUNDATION INSULATION

What type of insulation did you **typically** use with slab-on-grade foundations, beneath the slab and / or around the perimeter?

One ✓ **per column:**

	BENEATH SLAB	PERIMETER
Extruded polystyrene (e.g., Dow-Styrofoam®, etc.)	[]	[] 1
Expanded polystyrene (bead board)	[]	[] 2
Polyisocyanurate (e.g., Thermax®)	[]	[] 3
Fiberglass	[]	[] 4
No insulation used for slab	[]	[] 5
	843	844

THICKNESS OF SLAB INSULATION MATERIAL

What was the **typical thickness** of the insulation you used with slab-on-grade foundations, beneath the slab and / or around the perimeter?

One ✓ **per column:**

	BENEATH SLAB	PERIMETER
3/4"	[]	[] 1
1"	[]	[] 2
1-1/2"	[]	[] 3
2" or more	[]	[] 4
	845	846

BASEMENT AND CRAWL SPACE INSULATION

What method did you **typically** use to insulate the foundations of homes with basements or crawl spaces? (One ✓ **per column**)

	BASE- MENTS	CRAWL SPACES
Between floor joists of the ground floor	[]	[] 1
Entire interior and exterior surfaces of the foundation wall	[]	[] 2
Entire interior surface of foundation wall	[]	[] 3
Only above-grade interior	[]	[] 4
Entire exterior surface of foundation wall	[]	[] 5
Only below-grade portion of foundation wall exterior	[]	[] 6
Only above-grade portion of foundation wall exterior	[]	[] 7
Foundation wall cavity	[]	[] 8
NO foundation insulation used	[]	[] 9
	847	848

FOUNDATION WALL INSULATION TYPE

What material did you **typically** use to insulate your basement or crawl space walls, and what was the R-value?

If you insulated **both the interior and exterior** surfaces, you may ✓ **two** materials; otherwise ✓ **only one**.

	MATERIAL	R-VALUE
Fiberglass batt or blanket	[] 851_1	851_1r
Rockwool batt	[] 851_2	851_2r
Fiberglass / rockwool board	[] 851_3	851_3r
Extruded polystyrene (XPS)	[] 851_4	851_4r
Expanded polystyrene (EPS)	[] 851_5	851_5r
Polyisocyanurate	[] 851_6	851_6r
Spray foam	[] 851_8	851_8r
Other _____ (PLEASE SPECIFY)	[] 851_7	851_7r

HOUSES INSULATED BETWEEN FLOOR JOISTS

What material did you **typically** use to insulate between ground floor joists and what was the **typical** R-value?

	MATERIAL	R-VALUE
Fiberglass batt or blanket	[] 1	
Rockwool batt	[] 2	
Fiberglass blown	[] 3	
Cellulose blown	[] 4	
Spray foam	[] 5	
Foam board or SIPs	[] 6	
	849	850

GARAGE INSULATION

What **percent** of your garages had insulation installed in the:

Ceilings	853
All walls	854
Only walls shared with living space	855
Total need not add to 100%	

WALL CAVITY INSULATION MATERIAL

What **percent** of your homes had the following wall cavity insulation materials, and what were their R-values?

Do not include foam exterior wall sheathing.

	% HOMES	R-VALUE
NO wall cavity insulation	840	
Fiberglass batt	832	832r
Rockwool batt	833	833r
Fiberglass blown behind mesh ...	834	834r
Fiberglass blown-in, no mesh	835	835r
Cellulose blown behind mesh	836	836r
Cellulose blown-in, no mesh	837	837r
Spray foam	868	868r
Foam board, SIP, or ICF	838	838r
Other	839	839r
	(PLEASE SPECIFY)	
100%		

CATHEDRAL CEILING INSULATION MATERIAL

What **percent** of your **cathedral / sloped** ceilings were insulated with the following materials, and what was the typical R-value?

	% CATHEDRAL CEILINGS INSULATED	R-VALUE
NOT insulated	831	
Fiberglass batt or blanket	827	827r
Rockwool batt or blanket	828	828r
Spray foam	842	842r
Foam board or SIPs	829	829r
Other _____ (PLEASE SPECIFY)	830	830r
	100%	

SOUND INSULATION

What **percent** of your homes had insulation in their interior partition walls and / or floors-between-stories to dampen sound?

	SFD	SFA	MF BUILDINGS
Homes with wall sound insulation	806	807	808
Homes with floor sound insulation	806a	807a	808a

Of your homes with **wall sound insulation**, how many linear feet (LF) of interior partition wall did you insulate in your **typical** house or unit?

LF of wall with sound insulation	809	810	811
---	-----	-----	-----

Of your homes with **floor sound insulation**, how many square feet (SF) of floor area did you insulate in your **typical** house or unit?

Sq. Ft. of floor with sound insulation	809a	810a	811a
---	------	------	------

AIR INFILTRATION BARRIERS / HOUSE WRAP

What **percent** of your homes and multifamily buildings were wrapped with **air infiltration barrier** material?

Exclude roofing felt.

	SFD	SFA	MF BUILDINGS
Percent wrapped:	856	856a	856b

RADIANT BARRIERS

What **percent** of your houses had radiant barriers in the wall, roof, or ceiling assembly?

Radiant barrier roof sheathing	857
Other roof/ceiling/attic radiant barrier	857a
Radiant barrier in wall	858

Totals need not add to 100%

AIR (HVAC) DUCTS

What **percent** of your houses with ducted HVAC systems had the main duct and run-outs located in the:

Basement, crawl space or in framed floors only	1008
Attic only	1009
Both attic and basement or crawlspace	1010
In or under concrete floor slab	1011
Both in attic and concrete floor slab	1011a
	100%

AIR DUCT MATERIAL

What **percent** of your houses with ducted HVAC systems had the following types of duct material?

MAIN DUCTS

Metal	912
Flexible	913
Fiberglass, rigid (foil-faced fiberglass board)	914
Other _____ (PLEASE SPECIFY)	914a
	100%

RUN-OUT DUCTS

Metal	915
Flexible	916
Fiberglass, rigid (foil-faced fiberglass board)	917
Other _____ (PLEASE SPECIFY)	917a
	100%

WALL STACKS

Metal	918
Fiberglass, rigid (foil-faced fiberglass board)	919
NONE (wall cavity)	920
Other _____ (PLEASE SPECIFY)	920a
	100%

RIGID FIBERGLASS DUCTS

If you used any rigid fiberglass ducts, what was the typical thickness of the fiberglass board used? (**✓one**)

1 inch	[] ₁
2 inch	[] ₂
Other _____ (PLEASE SPECIFY)	[] ₃ 926

METAL DUCT INSULATION

If you used any metal duct, what **percent** of all the metal ducting was insulated by the following methods, if any?

Lined with insulation (insulation inside the duct)	921
Wrapped with insulation	922
NOT insulated	924
Other _____ (PLEASE SPECIFY)	923
	100%

METAL DUCT WRAP THICKNESS

If you used any duct insulation wrap, what was the typical thickness? (**✓one**)

1-1/2 inches or less	[] ₁
2 inches	[] ₂
More than 2 inches	[] ₃ 925

DECKS, PATIOS, PORCHES, & FLATWORK

What **percent** of your homes had the following structures, and what was their typical **size** in square feet?

	PERCENT	SQ. FT.
Deck (outside)	_____ 927	_____ 928
Patio / Pool deck	_____ 929	_____ 930
Breezeway	_____ 931	_____ 932
Front porch	_____ 933	_____ 934
Front stoop	_____ 935	_____ 936
Side porch	_____ 937	_____ 938
Screened-in porch	_____ 939	_____ 940

Totals need not add to 100%

PATIO / POOL DECK MATERIAL

What **percent** of your patios had surfacing material made of:

Poured concrete (include stamped or stenciled) ..	_____ 955
Concrete pavers	_____ 956
Brick pavers	_____ 957
Tiles	_____ 957a
Natural stone	_____ 958
Treated lumber	_____ 959a
Other _____ (PLEASE SPECIFY)	_____ 960
	100%

DECK AND PORCH MATERIAL

What **percent** of the decks and porches you built had decking or surface material made of:

	DECKS	PORCHES
Treated wood	_____ 961	_____ 968
Cedar	_____ 964	_____ 971
Redwood	_____ 965	_____ 972
Other untreated wood	_____ 966	_____ 973
Composite (Trex®, ChoiceDek®, etc) ...	_____ 966a	_____ 973a
Cellular PVC & other plastic (Azek®, etc)	_____ 967	_____ 974
Brick paver		_____ 975a
Tiles		_____ 975b
Concrete (incl. stamped& stenciled)		_____ 975
Natural stone		_____ 975c
	100%	100%

DECK AND PORCH RAILINGS

What **percent** of your decks and porches had railings?

Decks _____ % 1121 Porches _____ % 1122a

What **percent** of your deck and porch railings consisted primarily of the following materials?

	DECKS	PORCHES
Treated wood	_____ 1123	_____ 1122b
Cedar	_____ 1125	_____ 1124
Redwood	_____ 1127	_____ 1126
Other untreated wood	_____ 1129	_____ 1128
Composite (Trex®, ChoiceDek®, etc) ...	_____ 1131	_____ 1130
PVC & other plastic	_____ 1133	_____ 1132
Aluminum	_____ 1135	_____ 1134
Wrought iron or steel	_____ 1137	_____ 1136
Masonry or concrete (all types) .	_____ 1139	_____ 1138
Other _____ (PLEASE SPECIFY)	_____ 1141	_____ 1140
	100%	100%

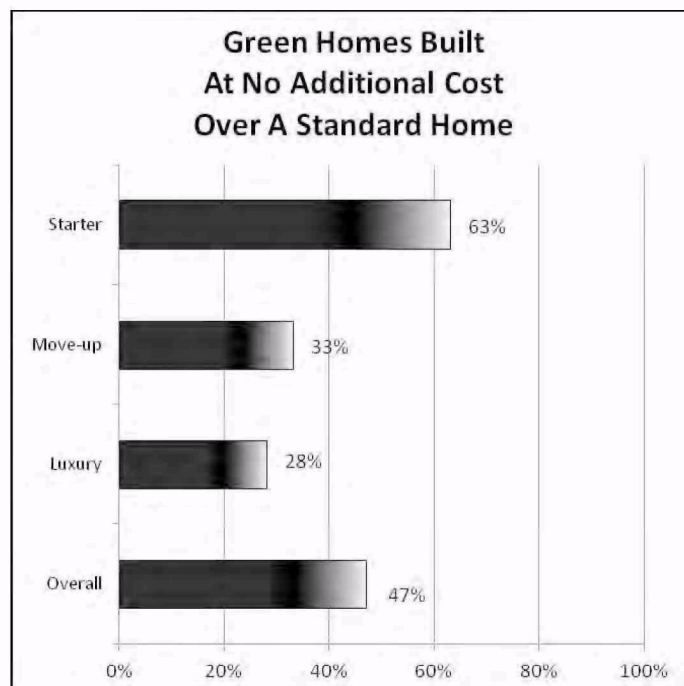
WALKWAYS & SIDEWALKS

How many **linear feet** of walkways and sidewalk did your typical home have?

_____ 976 LF

What **percent** of all your sidewalks and walkways were:

Poured concrete	_____ 977
Concrete paver	_____ 978
Asphalt	_____ 978a
Brick paver	_____ 979
Brick or clay tiles	_____ 979a
Natural stone	_____ 980
Crushed stone or gravel	_____ 981
Other _____ (PLEASE SPECIFY)	_____ 982
	100%



FENCING AND LANDSCAPE WALLS

What **percent** of your homes or living units had fencing / privacy walls or landscape / retaining walls installed on the lot as part of their sales contract?

	Fence / Privacy Wall	Landscape / Retaining Wall
SF Detached Houses	_____ % 987	_____ % 998
SF Attached Houses	_____ % 987a	_____ % 998a
Multifamily Buildings	_____ % 987b	_____ % 998b
Totals need not add to 100%		

For houses with fencing or walls, what was the typical **length** of fence or wall? (per building if multifamily)

	Fence / Privacy Wall	Landscape / Retaining Wall
SF Detached Houses	_____ LF 988	_____ LF 999
SF Attached Houses	_____ LF 988a	_____ LF 999a
Multifamily Buildings	_____ LF 988b	_____ LF 999b
Totals need not add to 100%		

What was the typical fence / wall **height**?

	Fence / Privacy Wall	Landscape / Retaining Wall
SF Detached Houses	_____ FT 989	_____ FT 1000
SF Attached Houses	_____ FT 989a	_____ FT 1000a
Multifamily Buildings	_____ FT 989b	_____ FT 1000b
Totals need not add to 100%		

FENCING AND LANDSCAPE WALL MATERIAL

What **percent** of the fences or walls were:

	Fence / Privacy Wall	Landscape / Retaining Wall
Wood – vertical boards on alternating sides	_____ 990	
Wood – vertical boards on one side ..	_____ 991	
Wood with horizontal rails / boards ..	_____ 992	
Chain link or wire w/ steel posts	_____ 993	
Wire w/ wood posts	_____ 993E	
Wrought iron	_____ 993b	
Ornamental steel	_____ 997d	
Aluminum	_____ 993c	
Plastic & wood fiber composite (Trex, etc.) ..	_____ 993a	
Vinyl, PVC, or other plastic	_____ 994	
Pre-cast concrete	_____ 997	
Poured concrete	_____ 997a	_____ 1004
Concrete retaining wall blocks (dry stacked)	_____ 997c	_____ 1003a
Mortared concrete block	_____ 997b	_____ 1003
Stone	_____ 995	_____ 1001
Brick	_____ 996	_____ 1002
Treated landscape timbers or lumber		_____ 1006
	100%	100%

If you built **wood** fence/privacy walls, what **percent** were:

Treated wood	_____ 977
Cedar	_____ 978
Redwood	_____ 978a
Other untreated wood	_____ 979
	100%

COUNTERTOPS

Indicate the **number** of cabinets and the **linear feet** of kitchen countertop you installed in a typical home.

	SFD & SFA	MF
Linear feet of Kitchen countertops ..	_____ 545	_____ 561

KITCHEN AND VANITY COUNTERTOP MATERIAL

What **percent** of your kitchen and bathroom vanity countertops were made of:

	KITCHEN	VANITY
Solid Surface (e.g., Corian [®] , Surell [®] , Swanstone [®])	_____ 584	_____ 590
Laminate (e.g., Formica [®] , WilsonArt [®])	_____ 585	_____ 591
Ceramic tile	_____ 586	_____ 592
Cultured marble	_____ 587	_____ 593
Engineered stone or quartz (Zodiaq [®] , Silestone [®])	_____ 587a	_____ 593a
Solid wood (butcher block)	_____ 588	_____ 594
Granite	_____ 589	_____ 594a
Marble, slate, or other natural stone	_____ 589a	_____ 595a
Other _____ (PLEASE SPECIFY)	_____ 589b	_____ 595b
	100%	100%

PLUMBING FIXTURES

What was the typical **number** of plumbing fixtures installed in each of your homes?

	SFD Starter ↓	SFD Move-up ↓	SFD Luxury ↓	SFA Per UNIT ↓	MF Per UNIT ↓
Lavatory sinks	_____ v1	_____ v10	_____ v19	_____ v28	_____ v37
Bathtubs (both standard and whirlpool)	_____ v2	_____ v11	_____ v20	_____ v29	_____ v38
Separate shower Stalls	_____ v3	_____ v12	_____ v21	_____ v30	_____ v39
Toilets	_____ v4	_____ v13	_____ v22	_____ v31	_____ v40
Bidets	_____ v5	_____ v14	_____ v23	_____ v32	_____ v41
Kitchen sinks	_____ v6	_____ v15	_____ v24	_____ v33	_____ v42
Bar sinks	_____ v7	_____ v16	_____ v25	_____ v34	_____ v43
Laundry tubs / sinks	_____ v8	_____ v17	_____ v26	_____ v35	_____ v44
Other _____ (PLEASE SPECIFY)	_____ v9	_____ v18	_____ v27	_____ v36	_____ v45

KITCHEN SINK TYPE

What **percent** of your kitchen sinks were:

Drop-in (self-rimming, overmount)	_____ v95
Undermount (sub-mount or under-counter)	_____ v96
Other _____ (PLEASE SPECIFY)	_____ v97
	100%

KITCHEN SINK MATERIAL

What **percent** of your kitchen sinks installed were:

Stainless steel v58
Enameled cast iron v59
Enameled steel (include Americast®) v60
Cultured marble v61
Solid-surface (Corian®, Swanstone®, etc.) v62
Granite / Stone (Moenstone®, Silgranit®,
Kindred Granite®, etc.) v62c
Acrylic v62a
Other v62b
(PLEASE SPECIFY) **100%**

KITCHEN SINK BASINS

What **percent** of your kitchen sinks had the following number of basins?

Single basin v90
Double basin v91
Triple basin v92
Other v93
(PLEASE SPECIFY) **100%**

KITCHEN SINK FAUCETS

What **percent** of your kitchen sink faucets had the following control types:

Single control (handle or lever) v201
Two controls (one for hot and one for cold) v202
100%

What **percent** of your kitchen sink faucets had the following finishes:

Chrome v203
Brass / Gold v204
Bronze (oil rubbed, polished, brushed, etc.) v205
Solid color (almond, white, black, biscuit, etc.) v206
Nickel v207
Stainless steel v208
Other v209
(PLEASE SPECIFY) **100%**

LAVATORY SINK TYPE

What **percent** of the lavatory sinks you installed were:

One-piece sink and countertop v46
Drop-in (self-rimming, overmount) v47
Wall-hung v48
Pedestal v50
Undermount (sub-mount or under-counter) v49
Vessel v49a
100%

LAVATORY SINK MATERIAL

What **percent** of all the lavatory sinks you installed were:

Vitreous china (ceramic) v51
Enameled cast iron v52
Enameled steel (include Americast®) v53
Cultured marble v54
Coated fiberglass v55
Acrylic v56
Solid-surface (Corian®, Swanstone®, etc.) v57
Other v57a
(PLEASE SPECIFY) **100%**

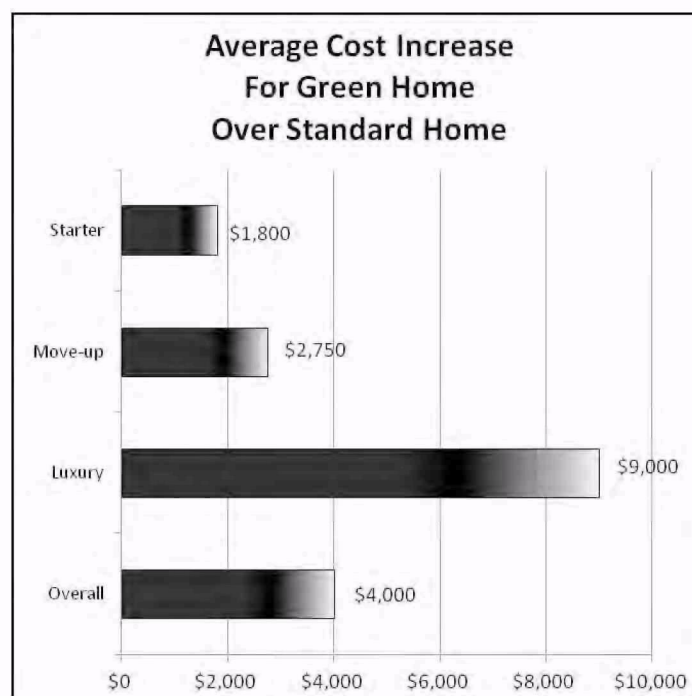
LAVATORY SINK FAUCETS

What **percent** of your lavatory sink faucets had the following control types:

Single control (handle or lever) v211
Two controls (one for hot and one for cold) v212
100%

What **percent** of your lavatory sink faucets had the following finishes:

Chrome v213
Brass / Gold v214
Bronze (oil rubbed, polished, brushed, etc.) v215
Solid color (almond, white, black, biscuit, etc.) v216
Nickel v217
Stainless steel v218
Other v219
(PLEASE SPECIFY) **100%**



BATHTUBS (NON-WHIRLPOOL)

What **percent** of all the non-whirlpool bathtubs you installed were:

Tub / Shower Combination

Coated fiberglass, one-piece	_____	v63
Coated fiberglass, multi-piece	_____	v63m
Acrylic, one-piece	_____	v64
Acrylic, multi-piece	_____	v64m
Other	_____	v64a
(PLEASE SPECIFY)		

Tub only

Enameled cast iron	_____	v65
Enameled steel	_____	v66
Cultured marble	_____	v67
Coated fiberglass	_____	v68
Acrylic	_____	v69
Solid-surface (e.g., Swanstone®, Avonite®, etc.)	_____	v70
Other	_____	v70a
(PLEASE SPECIFY)		100%

WHIRLPOOL BATHTUBS

What **percent** of your homes had whirlpool baths?

	SFD Starter ↓	SFD Move-up ↓	SFD Luxury ↓	SFA Units ↓	MF Units ↓
Whirlpool bathtubs	_____	_____	_____	_____	_____
	v2w	v11w	v20w	v29w	v38w

What **percent** of all the whirlpool baths you installed were:

Tub / Shower Combination

Coated fiberglass, one-piece	_____	v63w
Coated fiberglass, multi-piece	_____	v63wm
Acrylic, one-piece	_____	v64w
Acrylic, multi-piece	_____	v64wm
Other	_____	v64aw
(PLEASE SPECIFY)		

Tub only

Enameled cast iron	_____	v65w
Enameled steel	_____	v66w
Cultured marble	_____	v67w
Coated fiberglass	_____	v68w
Acrylic	_____	v69w
Solid-surface (e.g., Swanstone®, Avonite®, etc.)	_____	v70w
Other	_____	v70aw
(PLEASE SPECIFY)		100%

TUB / SHOWER DOORS

What **percent** of the tubs, showers, and whirlpool baths you installed had shower doors?

Bathtubs (non-whirlpool)	_____	v231
Showers	_____	v232
Whirlpool baths	_____	v233

Totals need not add to 100%

BATHTUB AND WHIRLPOOL SURROUNDS

What **percent** of the separate bathtubs and whirlpool baths you installed had **site-constructed** surrounds of the following materials?

NO separate bathtub surrounds were constructed	_____ %	v76
Ceramic tile	_____ %	v71
Marble, slate, or other natural stone	_____ %	v71a
Solid surface (e.g., Corian®, Avonite®, etc.)	_____ %	v72
Laminate (e.g., Formica, Wilsonart)	_____ %	v73
Fiberglass / Plastic	_____ %	v73a
Cultured marble	_____ %	v74
Other	_____ %	v75
(PLEASE SPECIFY)		100%

SEPARATE SHOWER STALLS

What **percent** of all the shower stalls you installed were:

Fabricated on-site from:

Ceramic tile	_____	v77
Marble, slate, or other natural stone	_____	v77a
Solid surface (e.g., Corian®, Avonite®, etc.)	_____	v78
Laminate (e.g., Formica®, Wilsonart®)	_____	v79
Cultured marble	_____	v80
Other	_____	v81
(PLEASE SPECIFY)		

Manufactured units of:

Coated fiberglass, one-piece	_____	v82
Coated fiberglass, multi-piece	_____	v82m
Acrylic, one-piece	_____	v83
Acrylic, multi-piece	_____	v83m
Other	_____	v84
(PLEASE SPECIFY)		100%

SHOWER BASES

What **percent** of the fabricated on-site showers you installed had manufactured bases or pans?

BATHTUB / SHOWER FAUCETS

What **percent** of your bathtub / shower faucets used the following control types:

Single control, pulled or lifted to turn on water ..	_____	v221
Single control, twisted to turn on water	_____	v222
Two controls (one for hot and one for cold)	_____	v223
		100%

What **percent** of your bathtub / shower faucets had the following finishes:

Chrome	_____	v224
Brass / Gold	_____	v225
Bronze (oil rubbed, polished, brushed, etc.)	_____	v226
Solid color (almond, white, black, biscuit, etc.) ..	_____	v227
Nickel	_____	v228
Stainless steel	_____	v229
Other	_____	v230
(PLEASE SPECIFY)		100%

STEAM GENERATORS

What **percent** of all the tubs, showers, and whirlpool baths you installed had Steam Generators?

Bathtubs	_____ v234
Showers	_____ v235
Whirlpools	_____ v236

SHOWERHEADS

What **percent** of the bathtubs and showers you installed had showerheads of the following types:

Standard / Fixed showerhead	_____ v249
Hand-held showerhead	_____ v250
Massaging showerhead	_____ v251
Thermostatic valves	_____ v252
Body sprays	_____ v253
Steam head	_____ v254
Other	_____ v255
(PLEASE SPECIFY)	

What **percent** of the bathtubs and showers you installed had the following:

More than 1 Standard showerhead	_____ v257
More than 1 Hand-held showerhead	_____ v258

Totals need not add to 100%

TOILETS

What **percent** of the toilets installed in your new homes were:

One piece (bowl and tank are one casting)	_____ v85_1
Two piece	_____ v85_2
100%	

What **percent** of the toilets had the following bowl styles?

Elongated	_____ v85_3
Standard	_____ v85_4
100%	

What **percent** of your toilets were dual flush?

Percent of toilets with Dual Flush	_____ v85_5
--	-------------

TOILET BRANDS

Of all the toilets you installed last year, what **percent** were the following brands?

	Percent
American Standard	_____ v85
Briggs	_____ v85a
Crane	_____ v85b
Eljer	_____ v85c
Gerber	_____ v86
Kohler	_____ v86a
Mansfield	_____ v86b
Sterling	_____ v86c
Toto	_____ v87
Universal-Rundle	_____ v87a
St. Thomas Creations	_____ v87b
Other	_____ v87c
(PLEASE SPECIFY)	
100%	

MOUNTED BATH ACCESSORIES

How **many** of the following are installed in your typical bathroom?

Towel bar	_____ v241
Towel ring	_____ v242
Robe hook	_____ v243
Toilet paper holder	_____ v244
Toothbrush and/or Tumbler holder	_____ v245
Shelf	_____ v246
Soapdish	_____ v247
Grab bars	_____ v248

APPLIANCES

RANGES, COOKTOPS & OVENS

What **percent** of your homes were equipped with ranges or cooktops and ovens that were:

	SFD	SFA	MF UNITS
Freestanding	_____ a1	_____ a6	_____ a11
Slide-in	_____ a2	_____ a7	_____ a12
Drop-in	_____ a3	_____ a8	_____ a13
Cooktop & wall oven(s) ..	_____ a4	_____ a9	_____ a14
NO range / cooktop / oven	_____ a5	_____ a10	_____ a15
100%		100%	100%

WALL OVEN CONFIGURATION

What **percent** of your new homes with built-in wall ovens had:

A single wall oven	_____ a34
Two separate wall ovens	_____ a35
Stacked double ovens in a single unit	_____ a36
100%	

BURNER TYPE

What **percent** of the cooking appliances you installed had the following types of burners?

<i>following types of burners?</i>	RANGES		COOKTOPS	
Electric				
Halogen burner / smoothtop	_____ a22	_____ a28	_____ a22	_____ a28
Smoothtop, not halogen	_____ a23	_____ a29	_____ a23	_____ a29
Conventional heat coils	_____ a24	_____ a30	_____ a24	_____ a30
Modular units for grill	_____ a25	_____ a31	_____ a25	_____ a31
Gas				
Sealed gas burners	_____ a26	_____ a32	_____ a26	_____ a32
Conventional gas	_____ a27	_____ a33	_____ a27	_____ a33
	100%	100%	100%	100%

FUEL TYPE

What **percent** of the equipment you installed used the following fuel types?

	RANGES		COOKTOPS		WALL OVENS	WATER HEATERS
Gas	_____ a16	_____ a18	_____ a18a	_____ a20	_____ a18a	_____ a20
Electric	_____ a17	_____ a19	_____ a19a	_____ a21	_____ a19a	_____ a21
Oil	_____ a21a	_____ a21a	_____ a21a	_____ a21a	_____ a21a	_____ a21a
100%		100%	100%	100%	100%	100%

MICROWAVE OVENS

What **percent** of your homes were equipped with microwave ovens that were:

	SFD	SFA	MF UNITS
Built-in with range	_____ a58	_____ a62	_____ a66
Built into cabinet	_____ a58a	_____ a62a	_____ a66a
Over-the-range	_____ a59	_____ a63	_____ a67
Countertop or hung under cabinets	_____ a60	_____ a64	_____ a68
Top unit of double wall oven	_____ a60a	_____ a64a	_____ a68a
NO microwave oven	_____ a61	_____ a65	_____ a69
	100%	100%	100%

REFRIGERATORS/FREEZERS

What **percent** of your homes were equipped with refrigerators that were:

	SFD	SFA	MF UNITS
Freezer on top, refrigerator below	_____ a70	_____ a74	_____ a78
Refrigerator on top, freezer below	_____ a71	_____ a75	_____ a79
Side-by-side refrigerator / freezer ...	_____ a72	_____ a76	_____ a80
Refrigerator with no freezer	_____ a72a	_____ a76a	_____ a80a
NO refrigerator	_____ a73	_____ a77	_____ a81
	100%	100%	100%

DISHWASHERS

What **percent** of your homes were equipped with:

	SFD	SFA	MF UNITS
Dishwashers with timing cycles	_____ a82	_____ a85	_____ a88
Dishwashers with cleaning sensors	_____ a83	_____ a86	_____ a89
NO dishwasher	_____ a84	_____ a87	_____ a90
	100%	100%	100%

Ranking Of Conditions That Need To Be Met For Builders To Go "Green"

Rank	Condition Met
1	Homes Cost the Same or Only Slightly More to Build
2	Homebuyers Will Pay More for a Green Home
3	Green Allows Flexibility in Home Design, Features
4	Green Homes are Easier to Sell
5	No Extensive Training of Subs, Vendors
6	"Green" Gives Me a Competitive Advantage
7	I Find the Right "Green" Building Program
8	Green Homes Become Easy to Build
9	My Competitors Do It
10	Preferential Treatment by Codes for "Green" practices
11	Green Homes are Higher in Quality

CLOTHES WASHERS

What **percent** of your homes were equipped with clothes washers that were:

	SFD	SFA	MF UNITS
Top loading washing machine	_____ a91	_____ a94	_____ a97
Front loading washing machine	_____ a92	_____ a95	_____ a98
NO washing machine ...	_____ a93	_____ a96	_____ a99
	100%	100%	100%

CLOTHES DRYERS

What **percent** of your homes were equipped with clothes dryers that were:

	SFD	SFA	MF UNITS
Electric dryer	_____ a100	_____ a103	_____ a106
Gas powered dryer	_____ a101	_____ a104	_____ a107
NO clothes dryer	_____ a102	_____ a105	_____ a108
	100%	100%	100%

OTHER APPLIANCES & HOME FEATURES

What **percent** of your homes were equipped with the following appliances?

	SFD	SFA	MF UNITS
Garbage disposal	_____ a113	_____ a117	_____ a121
Trash compactor	_____ a114	_____ a118	_____ a122
Hot water dispenser	_____ a115	_____ a119	_____ a123
Central vacuum – full system	_____ a116	_____ a120	_____ a124
Central vacuum – pre-pipe only	_____ a141	_____ a142	_____ a143
Elevator	_____ a144	_____ a145	_____ a146
Standby generator	_____ a147	_____ a148	_____ a149
Water softener	_____ a147a	_____ a148a	_____ a149a
Hot water recirculation piping	_____ a147b	_____ a148b	_____ a149b
Code required fire sprinkler system	_____ a147d	_____ a148d	_____ a149d
Non-code required fire sprinkler system	_____ a147c	_____ a148c	_____ a149c
Totals need not add to 100%			

FIRE SPRINKLER SYSTEMS (Skip if none installed)

What **percent** of your fire sprinkler piping was:

	SFD & SFA	MF
CPVC	_____ s101	_____ s106
PEX	_____ s102	_____ s107
Steel/Iron	_____ s103	_____ s108
Copper	_____ s104	_____ s109
Other _____ (PLEASE SPECIFY)	_____ s105	_____ s110
	100%	100%

What **percent** of your fire sprinkler systems were:

	SFD & SFA	MF
Stand-alone fire sprinkler systems	_____ s111	_____ s113
Combined plumbing and fire sprinkler systems	_____ s112	_____ s114
	100%	100%

WATER PIPES

What **percent** of your homes' **water service** (from the street to the house); **distribution** (hot/cold water plumbing within the house); **waste & vent** (DWV piping that drains water from the sinks, toilets, etc) pipe was the following types:

	WATER SERVICE	DISTRIBUTION	WASTE & VENT
Copper	_____ v210s	_____ v210d	_____ v210w
PVC or CPVC	_____ v211s	_____ v211d	_____ v211w
Polyethylene (PE) ...	_____ v212s		
PEX or PEX-AL-PEX	_____ v213s	_____ v213d	
Steel / Cast iron	_____ v215s		_____ v215w
ABS			_____ v216w
	100%	100%	100%

If you used PEX **plumbing** systems, what percent of the piping, fittings, and manifolds were the following brands:

	PIPING	FITTINGS	MANIFOLDS
Bow	_____ v217p	_____ v217f	_____ v217m
IPEX	_____ v218p	_____ v218f	_____ v218m
JM Eagle	_____ v219p	_____ v219f	_____ v219m
NIBCO	_____ v220p	_____ v220f	_____ v220m
Rehau	_____ v221p	_____ v221f	_____ v221m
Sioux Chief		_____ v222f	_____ v222m
Uponor	_____ v223p	_____ v223f	_____ v223m
Viega	_____ v224p	_____ v224f	_____ v224m
Watts	_____ v225p	_____ v225f	_____ v225m
Zurn	_____ v226p	_____ v226f	_____ v226m
Don't know	_____ v227p	_____ v227f	_____ v227m
Other	_____ v228p	_____ v228f	_____ v228m
	100%	100%	100%

What percent of the PEX **plumbing** systems you installed were:

	SFD Starter ↓	SFD Move-up ↓	SFD Luxury ↓	SFA Units ↓	MF Units ↓
Trunk & Branch	_____	_____	_____	_____	_____
Home Run	_____	_____	_____	_____	_____
Zone (remote manifold)	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____
Don't know	_____	_____	_____	_____	_____
	100% v229s	100% v229m	100% v229l	100% v229t	100% v229a

What percent of the **fittings** for your PEX **plumbing** systems were:

	SFD Starter ↓	SFD Move-up ↓	SFD Luxury ↓	SFA Units ↓	MF Units ↓
Engineered plastic	_____	_____	_____	_____	_____
Copper/Brass ...	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____
Don't know	_____	_____	_____	_____	_____
	100% v230s	100% v230m	100% v230l	100% v230t	100% v230a

CONFIGURATION OF HVAC SYSTEMS

What **percent** of your homes (or multifamily units) had the following **primary heating systems**:

Standard heat pump w/ electric backup heat	_____ h101
Standard heat pump w/ gas or propane backup	_____ h102
Geothermal heat pump	_____ h103
Gas or propane furnace or boiler	_____ h104
Oil furnace or boiler	_____ h105
Electric furnace, baseboard, or radiant	_____ h106
No primary heating system	_____ h107
	100%

HEATING DISTRIBUTION SYSTEMS

What **percent** of your homes with primary heating systems had the following **heating distribution systems**:

Ductless Heat Pump	_____ h111
Forced Air—one zone only	_____ h112
Forced Air—two or more zones	_____ h113
Hydronic—radiant floor	_____ h114
Hydronic—baseboard or radiators	_____ h115
Other type of distribution system	_____ h116
	100%

AIR CONDITIONING SYSTEMS

What **percent** of your homes had the following types of air conditioning systems:

No air conditioning system installed	_____ h121
Evaporative cooler	_____ h122
Single AC unit	_____ h123
Two or more AC units	_____ h124
Ductless heat pump or AC	_____ h125
	100%

HVAC SYSTEM FEATURES

What **percent** of your homes had the following as part of their HVAC systems:

High performance air cleaner (HEPA, electronic)	_____ h131
Humidifier	_____ h132
Heat Recovery Ventilators (HRV, ERV)	_____ h133
Non-energy-recovery fresh air exchangers	_____ h134
	Total need not add to 100%

EFFICIENCY RATINGS OF WARM AIR FURNACES

Of all the furnaces installed in the homes your firm built, what **percent** had efficiency ratings of:

Less than 78%	_____ h141
78% to 79.9%	_____ h142
80% to 89.9%	_____ h143
90% to 95%	_____ h144
95.1% or greater	_____ h145
Don't know	_____ h146
	100%

AIR CONDITIONER EFFICIENCY

What **percent** of air conditioning systems and heat pumps installed in your home had SEER ratings of:

Less than 13	_____	h151
13.0 to 14.9	_____	h152
15.0 to 16.9	_____	h153
17.0 to 18.9	_____	h154
19.0 to 20.9	_____	h155
21 or higher	_____	h156
Don't know	_____	h157
100%		

PRACTICES REGARDING RADON GAS

Please answer these questions even if you used **NO** radon-reducing practices.

SUB-SLAB OR SUB-MEMBRANE VENTILATION

What **percent** of the houses you built had the following types of ventilation systems to reduce radon:

	BASEMENTS OR SLABS	CRAWL SPACES
NO venting installed to reduce radon	_____ 791	_____ 795
A rough-in for ventilation (not a complete system, e.g., capped pipe riser in basement)	_____ 788	
Passive stack ventilation	_____ 789	_____ 792
Fan-driven (active) depressurization	_____ 790	_____ 793
Foundation wall vents	_____ 794	_____ 794
100%		100%

SEALING METHODS OF HOUSES WITH SLAB OR BASEMENT FOUNDATIONS

How do you seal your slabs? If you **don't** seal, ✓ "**NO** slab sealing method used." (✓ all that apply)

NO slab sealing method used	[] 803
Polyethylene or other membrane under slab	[] 796
Membrane on foundation walls below grade	[] 797
Caulk around slab, wall openings and slab joints	[] 798
Seal interior of foundation walls	[] 799
Locate sump access outside of basement	[] 800
Install air tight sump pit covers	[] 801
Other	[] 802
(PLEASE SPECIFY)	

RADON TESTING

What **percent** of your homes were tested for radon? _____ %
804

Of the houses tested for radon, what **percent** needed further work to reduce radon to less than 4 pCi/L? _____ %
805

PASSIVE vs. ACTIVE SUBSLAB VENTILATION

If you installed **PASSIVE** sub-slab or sub-membrane ventilation (without a fan), what was the typical cost for you to include these features per home? (✓ one)

Less than \$200	[] 1
\$200 to \$299	[] 2
\$300 to \$399	[] 3
\$400 to \$499	[] 4
\$500 to \$599	[] 5
\$600 to \$799	[] 6
\$800 or more	[] 7
v114	

If you installed **ACTIVE** sub-slab or sub-membrane ventilation (with a fan), what was the typical cost for you to include these features per home? (✓ one)

Less than \$450	[] 1
\$450 to \$549	[] 2
\$550 to \$649	[] 3
\$650 to \$749	[] 4
\$750 to \$849	[] 5
\$850 to \$1049	[] 6
\$1050 or more	[] 7
v120	

INFRASTRUCTURE

What **percent** of your single family detached dwellings were located:

	SFD
In residential developments	_____ h201
Not in residential developments	_____ h202
100%	

What **percent** of your homes & multifamily buildings located in residential developments had frontage on the following:

	SFD	SFA & MF
Concrete streets	_____ h203	_____ h206
Asphalt streets	_____ h204	_____ h207
Other:	_____ h205	_____ h208
(PLEASE SPECIFY)		
100%		100%

What **percent** of your homes and multifamily buildings located in residential developments were on streets with the following:

	SFD	SFA & MF
Sidewalks	_____ h209	_____ h214
Curbs and gutters	_____ h210	_____ h215
Curbs only, no gutters	_____ h211	_____ h216
Gutters only, no curbs	_____ h212	_____ h217
No curbs or gutters	_____ h213	_____ h218

Total need not add to 100%

STANDBY GENERATORS

What **percent** of your standby generators were:

Natural gas g106
Propane/LP gas g107
Gasoline g108
Diesel g109
Other g110
100%

What **percent** of your standby generators were:

Not permanently installed (portable) g114
Permanently installed 7kW to 20kW g115
Permanently installed over 20kW g116
100%

What **percent** of your standby generator installations included:

Manual transfer switch g114a
Automatic transfer switch g115a
100%

UPDATES

Would you like to receive periodic communications on NAHB

Research Center testing results and programs via e-mail?

No ☐ 1 Yes ☐ 2 a160

(PLEASE SPECIFY E-MAIL ADDRESS)

PLEASE SELECT ONE OF THE FOLLOWING GIFTS:

☐ Navy Full-Zip Hooded Sweatshirt (M)
☐ Navy Full-Zip Hooded Sweatshirt (L)
☐ Navy Full-Zip Hooded Sweatshirt (XL)
☐ Navy Full-Zip Hooded Sweatshirt (2X)
☐ Navy Full-Zip Hooded Sweatshirt (3X)

☐ Blue Dress Shirt (M)
☐ Blue Dress Shirt (L)
☐ Blue Dress Shirt (XL)
☐ Blue Dress Shirt (2X)
☐ Blue Dress Shirt (3X)

Thank You for Your Time and Cooperation!

Comments or questions? Contact Joanne McAlpin at jmcAlpin@nahbrc.com or 1-800-638-8556 ext. 6306.

Returning the Questionnaire

1. If your name or address differs from the address label, please make appropriate corrections (this will be used to send your gift)
2. If you'd like to participate in online surveys and earn more free gifts, please include your email address above
3. Place your completed survey in the postage-paid return envelope (see center of survey) and drop it in the mail