BPI-2200-S-2013

STANDARD FOR HOME PERFORMANCE-RELATED DATA COLLECTION
v2.2.0

THE SYMBOL OF EXCELLENCE FOR HOME PERFORMANCE CONTRACTORS

AUGUST 2, 2016

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This standard was formulated under the cognizance of the BPI Standards Technical Committee.

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Introduction (Informative)

BPI-2200-S-2013 v2.2.0 *Standard for Home Performance-Related Data Collection* (BPI-2200) is designed to facilitate communication and the exchange of information and data among all actors in the home performance industry by providing a standard vocabulary for describing terms related to buildings, energy consumption, and energy conservation measures (ECMs).

The term “home performance” is used in this standard in a broad sense of the term to indicate the practices used to increase the energy efficiency (i.e., reduce the energy consumption) of residential buildings considered as a system.

The terms “whole-house upgrade” or “upgrade” are used in this standard to indicate a comprehensive set of measures that together significantly increase the energy efficiency of a building. The synonymous term “retrofit,” although common in the home performance industry, is not used in this standard.

The terms “energy audit” and “audit” are used interchangeably to indicate an assessment of the opportunities for reducing the energy consumption of a building.

1. Scope

This standard provides requirements for the prescribed fields for collecting home performance-related data and the minimum measure description collection criteria. The scope of this standard is limited to existing detached single-family dwellings and townhouses that have independent mechanical systems for each dwelling unit (heating, cooling, water heating, and ventilation); direct access to outdoors for each dwelling unit; and were designed to have continuous party walls with no penetrations to adjacent units, with such party walls extending from ground to roof where the dwelling unit is attached to one or more adjacent single-family dwelling units.

2. Objective

The standard is intended to reduce the transactional costs associated with collecting and transferring data by making communication between systems easier, and by providing a basis for the creation of data transfer and storage standards. BPI-2200 is also intended to enhance research and evaluation efforts by facilitating comparison and analysis of information from multiple programs through data standardization.

BPI-2200 does not specify all terms used within the home performance industry. Many of the detailed terms needed for energy modeling or for quality assurance (QA), for example, are not included in this iteration of the standard. Future versions of BPI-2200 may be expanded to include such terms.

3. Alignment with Other Standards

BPI-2200 is intended to provide the data elements that form the basis of the extensible mark-up language (XML) schema defined in a separate BPI standard (BPI-2100-S-2013 *Standard for Home Performance-Related Data Transfer v2.2.0).* BPI-2100 provides a way to structure and communicate information about whole-house energy efficiency upgrades.

To promote standardization within the residential energy efficiency industry, BPI-2200 is also aligned with the data needs and vocabularies of two initiatives supported by the U.S. Department of Energy: the Building Energy Data Exchange Specification (BEDES) and the Home Energy Score (HES).

The goal of BEDES is to facilitate the utilization and sharing of empirical building energy performance data among software tools and data collection and analysis activities, more easily and consistently and at lower cost. It provides the data elements used in the Standard Energy Efficiency Data (SEED) platform, a software application that helps organizations easily manage data on the energy performance of large groups of buildings. Because BEDES is focused on commercial as well as residential buildings, BEDES contains data elements not relevant to the scope of BPI-2200; conversely, BPI-2200 contains elements specific to the home performance industry that are not included in BEDES. For the subset of information relevant to both data sets, an effort was made to use the same definitions and to structure the data in the same way to ensure the greatest degree of compatibility.

BPI-2200 is also designed to include all terms necessary to generate a HES.

4. Data Vocabulary

BPI-2200 defines a standard vocabulary of data elements necessary to provide a general description of a whole house energy efficiency upgrade for reporting, rebate and basic QA purposes. This vocabulary allows description of the following:

- Contractors
- Customers
- Buildings, building components and building systems
- Energy conservation measures
- Energy consumption
- Energy savings (estimated and actual)

The vocabulary allows description of both the physical properties and performance of buildings and measures.

5. Required Use of Vocabulary

Compliance with BPI-2200 requires use of these data elements in all cases in which a BPI-2200 data element is sufficient to adequately represent the person, characteristic, concept or other home-related datum. Data can be “adequately represented” by the BPI-2200 vocabulary if BPI-2200 data elements, singly or in combination, can provide a representation of the thing or person to be described that a) could reasonably be understood by other home performance professionals, and b) does not result in significant loss of information or create significant risks of miscommunication.

6. Data Sets for Specific Use Cases

BPI-2200 is intended to define 1) a vocabulary for the home performance industry and 2) the data sets required to be collected for specific use cases, such as the energy audit or the job completion report.

This version of BPI-2200 addresses only the first objective: defining a common vocabulary for the home performance industry. Future versions of the standard will specify required or recommended data sets for specific uses.

Annex A: Guidance Regarding Use of Data Elements (Informative)

This informational annex provides additional information regarding the organization and structure of the data elements that are not evident from the list format in which they are presented in Annex B.

In this section, data elements specified in BPI-2200 are indicated in quotation marks (e.g., “auditor qualification”). Explanations are made in terms of how the data elements specified in the standard can be used. Often there are several data elements that can be used to describe a particular characteristic of a building or measure of a home performance upgrade. “Glass type,” for example, can be used to describe the nature of the glass used in a window through use of a standard set of other data elements, including “low-e,” “tinted,” or “reflective.” The characteristics of a window can also be described with the elements “U-factor,” “NRFC-certified,” or “frame type.” This writing convention is carried throughout the standard.

A.1. Relationships Between Data Elements

Some relationships between data elements are explicitly specified. Many data elements can be described by a set of other data elements. A window frame, for example, can be described as “aluminum,” “composite,” “fiberglass,” “steel,” “vinyl” or “other.”

Other relationships are implicit. Data elements describing the nature or monetary value of specific incentives, for example, could be associated with a wide range of energy conservation measures, such as insulation or duct sealing, or with an entire whole-house upgrade.

A.2. Multiple Ways to Describe Building Characteristics

In a number of cases, BPI-2200 provides more than one way to describe a specific building component or energy conservation measure. A building’s air leakage, for example, can be described either in terms of a blower door measurement (e.g., numberCFM50), or through use of a set of specified qualitative terms (“very tight,” “tight,” “average,” “leaky,” etc.).

These different pathways for describing the same characteristic reflect the fact that different users require different degrees of accuracy. If a program does not require blower door testing, for example, participating contractors will not typically be able to provide an infiltration measurement in CFM50; the standard provides an alternative way to describe building leakiness in such situations.

It is expected that users will structure the data elements defined in BPI-2200 in multiple ways, according to their specific needs.

A.3. Organization of Data Elements

The data elements listed in Annex B comprise the BPI-2200 standard vocabulary. For the sake of presentation, the data elements in Annex A are organized into a set of general categories:

- Customer Information
- Contractor Information
- Site and Building Envelope
- Systems
- Appliances
- Lighting
- Pools
- Health and Safety
- Project Information
- Utility or Fuel Provider
- Consumption
- Software

A.4. Data Element Description

Much of the vocabulary in BPI-2200 is self-evident in that the name of the data element is similar or identical to a word typically used in the home performance profession. The “door” data element, for example, corresponds to what is typically referred to as a “door” in the home performance industry, i.e., a movable barrier located in an entranceway between two spaces separated by a partition.

Definitions for some of the less self-evident or self-explanatory data elements are provided in this section and in Annex B.

A.4.1 Customer Information

The data elements in the Customer section can be used to provide contact information about the customer (name, mailing address, phone number, e-mail address, etc.) or other contacts.

A.4.2 Contractor Information

The data elements in the Contractor section can be used to provide information about contractors, subcontractors, and their businesses. This includes individual contact information, which is replicated in the customer section above, business information (business name, address, telephone number, etc.) and qualifications or certifications held by the business.

Contractors can also be identified by business type (auditor, contractor, subcontractor, property manager) and by specialization (HVAC, insulation, etc.).

A.4.3 Site and Building Envelope

The data elements in the Site and Building Envelope section enable a description of the building being upgraded, including a description of the occupants, the site, and construction details.

Data elements concerning a "site," including address and school district, can be used to indicate the project location, but can also be used to describe other locations, such as a business office.

A site can be given a unique "Site ID." This can be used to ensure that all sites that receive an upgrade through a program can be easily identified and distinguished.

Sites can be described in terms of their location in a number of zones, including the U.S. Department of Energy and International Energy Conservation Code climate zones, termite zones, radon zones, and others.

A.4.3.1 Zone

The "zones" and "spaces" data elements allow specific areas within a building to be identified, and for HVAC, lighting, and other systems to be associated with a specific zone or space.

Many use cases will not require the level of detail that the data elements in this section allow. However, if a detailed description of the shape of a building, or of a building's wall assemblies, is necessary, the data elements in this section would allow a description of these elements in considerable detail.

A.4.3.2 Enclosure

This section incorporates data elements that make up a building's enclosure or building envelope.

Air sealing

"Test ID" can be used to provide a unique test identification number if multiple tests need to be recorded.

Building leakiness can be described in two ways: either with a number indicating air leakage in terms of a specific unit (e.g., CFM50, ACHnatural), or in qualitative terms ("very tight," "tight," "average," etc.)

Insulation

Insulation can be described in multiple ways. It can be described either in terms of nominal R-value or in terms of inches. It can also be described by type (e.g., fiberglass, cellulose).

The “layer” data element allows for individual layers of insulation to be described for situations in which two or more types of insulation have been installed or applied in the same area.

Data elements to indicate the location where a particular type of insulation was installed, including “attic roof,” “attic kneewall,” “crawlspace wall,” etc., are provided.

Attic and Roof

Attic and roofs can be described in terms of type, surface area, color, pitch, and slope. This subsection also includes information on rafters, including framing factor and studs.

Foundations

This section includes information on foundations including location, thermal boundary, frame floor, slab, and foundation walls. Each area or type of foundation (i.e., frame floor, slab, foundation walls) has a system ID associated with it so the data element can be referenced with other elements, for example, when there is a window on a foundation wall.

Rim Joists

Rim joists may be described in terms of surface area, proximity to other areas of the building, and stud size, material, and spacing.

Walls

Walls can be described in terms of their proximity to other rooms of a house, orientation, size, color and material.

Windows

The Window ID data element allows windows to be grouped according to type, i.e., windows with similar characteristics (similar glazing, frames, location, etc.) can be grouped together. In cases in which only very general information about all windows in a building is required, or in which all windows in a building are identical, a single Group ID can be used.

A window or window group can be described in terms of a number of characteristics, including orientation, condition, glass type, number of layers, U-factor, NFRC-certified, interior and exterior shading, etc.

The “window area” data element can be used to provide the square footage of all windows in a window group.

Subjective evaluation of window condition can be made in terms of “good,” “moderate,” or “poor.”

Window groups can be identified according to the wall in which they are located

The window-to-wall ratio of the building can be provided.

Doors

The “Door ID” data element allows doors to be organized into groups with common characteristics.

Skylights

The characteristics of glass in skylights can be described using the same data elements that allow description of windows.

A.4.4 Systems

The vocabulary allows HVAC systems to be identified with a system ID, which facilitates descriptions of buildings with multiple systems. This also allows for a system or systems to be:

- Associated with a building location (e.g., a CAZ or a Zone);
- Associated to one or several distribution systems;
- Associated with a control device (e.g., a device that controls both an AC and a furnace)

Data elements that can be used to describe any HVAC system are grouped together.

Data elements for describing specific types of HVAC systems are subdivided into three sections: heating, cooling, and heating and cooling. The heating and cooling section includes data elements designed specifically to describe heat pumps.

In buildings with multiple zones, HVAC systems can be identified as providing heating or cooling to a specific zone.

Data elements are provided to identify which combustion venting system and distribution system are used by an HVAC system. (Both combustion venting and distribution systems can be given a System ID.)

A standard list of fuel types is provided for all HVAC systems.

Vocabulary provided for HVAC controls includes information about control type, setpoint/setup/setback temperatures, and other information.

Several data elements allowing a general description of maintenance schedules and several common types of maintenance are provided.

A.4.4.1 Combustion Ventilation

HVAC combustion venting systems can be given a System ID, which allows the description of a situation in which HVAC or hot water systems are using a shared venting system.

A.4.4.2 HVAC Distribution Systems

The data elements in this section allow description of HVAC distribution systems. Each system can be identified with an ID, in the event that there are more than one in the building. As mentioned above, the HVAC Distribution ID can also be used to associate a single distribution system with one or more HVAC units. For example, a duct system can be associated with both an AC and a furnace. Duct improvements could then be associated with the performance characteristics of the AC and the furnace system. The zones that each system serves can also be identified.

The data elements in this section allow description of duct leakage. As with building leakage, two options for describing duct leakage are provided: a quantitative reading in CFM25 (or other units), or a qualitative description that includes the data elements “no observable leaks,” “some observable leaks,” “catastrophic leaks,” etc.

A.4.4.3 Domestic Hot Water (DHW) Systems

DHW systems can be identified with a system ID if the home has several such systems.

The list of DHW types includes types that would commonly be encountered in a home performance upgrade.

As with HVAC systems, a DHW system can be identified as being in a particular zone, if necessary.

The data elements in this section allow description of DHW distribution systems and insulation, including pipe insulation and water heater jackets.

A.4.4.4 Photovoltaic

The data elements in this section allow for a basic description of a photovoltaic array, including “array azimuth,” “array tilt,” and “maximum power output,” the location of the PV system, inverter efficiency, ownership, and the year the inverter was manufactured.

A.4.4.5 Wind

The data elements in this section allow for a basic description of a wind turbine including model, year installed, hub height, and rotor diameter. Data elements also allow for a description of the AWEA rated sound level, annual energy, and rated power.

A.4.5 Appliances

A number of data elements potentially relevant for describing all types of appliances are grouped together. These include manufacturer, model number and year, serial number, and third party certification.

Vocabulary or data elements specific for describing different types of appliances are shown under the heading of the appropriate appliance.

Several data elements address behavioral phenomena, such as “Usage” in loads per week for dishwashers.

A.4.6 Lighting and Miscellaneous Loads

The “Lighting ID” data element allows lights with common characteristics, such as type and average wattage, to be grouped together. Other common characteristics of the lighting group can be described, including average wattage, third party certification, and floor area served.

Two different ways to describe lighting usage are provided: either average hours per day per bulb can be indicated, or usage can be indicated by a series of ranges (1-4 hours per day, 4-12 hours per day, etc.).

The “attached to space” data element allows a light or lighting group to be identified as located within a specific space in the building (as described with the “space” data element).

Data elements for describing lighting controls are provided.

Data elements for a set of major plug loads (e.g., plasma TV, computer, space heater, water bed, electric vehicle, etc.) are provided. The “other” data element allows plug loads to be indicated as necessary.

A.4.7 Swimming Pools

The data elements in the Swimming Pools section can be used to describe the characteristics and use of one or more swimming pools, pool pumps, cleaners, and heaters. Data elements can be used to characterize in ground, above ground, or on ground pools, as well as pool volume, months per year of operation, and filter type.

A.4.8 Health and Safety

The data elements in the Health and Safety section concern ventilation (whole-house and spot), Combustion Appliance Zone (CAZ) testing, combustion appliance testing, lead paint, asbestos, radon, source pollutants and pests.

BPI standards were used as guidance for the vocabulary for the CAZ and appliance testing sections, and a number of U.S. Environmental Protection Agency documents were used as guidance for the vocabulary for environmental hazards.

A.4.8.1 Ventilation Design

An ID number can identify fans if multiple fans need to be described.

A.4.8.2 Combustion Appliance Zone Testing

If multiple CAZ are present, an ID number can identify them. These ID numbers can be used to indicate in which CAZ a specific combustion appliance is located.

The term “poor case” is used rather than “worst case” to indicate a number of testing conditions, as it cannot usually be proven that a given set of conditions represents a “worst case.”

A.4.8.3 Moisture Control

The data elements in this section allow identification of areas within the building where water damage is located and several common moisture control measures.

A.4.9 Project Information

A project can be assigned a unique Project ID to distinguish it from all other projects. The Project ID can be used to distinguish between projects conducted in two different dwelling units in the same building, or two projects done at different times in the same building or dwelling unit.

The program name and sponsor can be identified, if applicable.

The “Project Status” data element can be used to indicate what phase of the upgrade process a particular set of data pertains to. Options include the audit, the proposed work scope, the approved work scope, test out/job completion and QA. “Start date,” “estimated completion date,” and “actual completion date” data elements can be used to provide additional information about the timing of a project.

“Project cost” can be used to specify the total cost of the project, and incentives can be used to detail one or more incentives associated with the project.

Energy savings data elements can be used to provide information about projected or actual (measured) energy savings associated with a project or measure. Savings can be expressed in a number of ways, including total savings, cost savings or savings by dollars, as well as savings by particular fuel. End use savings can also be provided for specific fuels.

Detail about the measures proposed or implemented as part of the upgrade can be described in detail. A number of data elements can be associated with each measure, as necessary, including:

- Quantity
- Location within the building
- Estimated life
- Installation date
- Cost
- Incentives associated with the measure
- Resources savings
- Energy savings

- Water savings
- Installing contractor (or subcontractor)
- Status (recommended, installed, not installed)
- QA status (passed, failed, not tested, comments)
- Repaired
- Replaced

A.4.10 Consumption

The data elements in this section can be used to describe water and energy savings and consumption. Water and energy consumption can be described in a number of ways, including unit of measurement, cost, reading type, and interval type.

This section also contains data elements that describe the information necessary for the "true-up" calculations specified in ANSI/BPI-2400-S-2015 *Standard Practice for Standardized Qualification of Whole-House Energy Savings Predictions by Calibration to Energy Use History*.

Data elements for detailing water consumption are also provided.

A.4.11 Utility or Fuel Service Provider

The vocabulary allows details about the utility or fuel/resource provider to be collected, including meter and account numbers, and whether permission was granted to access the data.

A unique ID number may identify utility or fuel service providers if there are multiple service providers per project or building.

A.4.12 Software

The data elements in this section include information on the type of software used for modeling and its version.

Annex B: BPI-2200-S-2013 v.2.2.0 HPXML Data Elements (Normative)

HPXML data elements are listed on the following pages.

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B.10 Appliances
B.11 Lighting
B.12 Miscellaneous Loads
B.13 Pools
B.14 Health and Safety
B.15 Modeled Usage
B.16 Project Information
B.17 Resource Savings
B.18 Consumption Information
B.19 Utility or Fuel/Resource Service Provider Information
B.20 Software Information

ANNEX B.1 CUSTOMER INFORMATION

	Data element	Definition	Units	Data type	Enumeration	Notes
B.1.1	Prefix			Text		May be repeated for multiple contacts
B.1.2	First name			Text		May be repeated for multiple contacts
B.1.3	Middle name			Text		May be repeated for multiple contacts
B.1.4	Last name			Text		May be repeated for multiple contacts
B.1.5	Suffix			Text		May be repeated for multiple contacts
B.1.6	Individual type			Enumeration	Owner-occupant, Owner-non-occupant, Property manager, Real estate agent, Tenant, Other	May be repeated for multiple contacts
B.1.7	Telephone type			Enumeration	Day, Evening, Mobile	May be repeated for multiple contacts
B.1.8	Telephone number			Text		May be repeated for multiple contacts
B.1.9	Is telephone the preferred contact method?			Boolean		May be repeated for multiple contacts
B.1.10	Telephone extension			Text		May be repeated for multiple contacts
B.1.11	Email type			Enumeration	Personal, Work, Other	May be repeated for multiple contacts
B.1.12	Email address			Text		May be repeated for multiple contacts
B.1.13	Is email the preferred contact method?			Boolean		May be repeated for multiple contacts
B.1.14	Address type	Indicate if street or mailing address		Enumeration	Street, Mailing	
B.1.15	Address 1	Street or other address, including street number, street name, apartment number, and any other identifiers		Text		

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B.1.16	Address 2	Street or other address, including street number, street name, apartment number, and any other identifiers		Text		
B.1.17	City or municipality	The city in which the site is located		Text		
B.1.18	State	2-letter state abbreviation. Entities designated can include a state, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Commonwealth of the North Mariana Islands, the United States Virgin Islands, or any other territory or possession of the United States.		State code		
B.1.19	Zip code	The United States Postal Service postal code where the property is located. This can be defined as the standard 5 number postal code, or it can have the additional 4 number code separated by a hyphen.		Number		
B.1.20	USPS bar code	The United States Postal Service Intelligent Mail barcode		Number		

ANNEX B.2 CONTRACTOR INFORMATION

	Data element	Definition	Units	Data type	Enumeration	Notes
B.2.1	Business name			Text		May be repeated for multiple contactors
B.2.2	Business type			Enumeration	Contractor, Auditor, Subcontractor, Property manager	May be repeated for multiple contactors
B.2.3	Business specialization			Enumeration	Energy audit, HVAC, Insulation, Carpentry, Plumbing, Electrical, Painting, Other	May be repeated for multiple contactors
B.2.4	Certification			Enumeration	BPI, RESNET, Other	May be repeated for multiple contactors
B.2.5	Type of business contact			Enumeration	Owner, Auditor, Implementer, Other	May be repeated for multiple contactors
B.2.6	Auditor qualification			Enumeration	PE, CEM, BPI-BA, RESNET-Home Partner, RA, Other	May be repeated for multiple contactors
B.2.7	Implementer qualification			Enumeration	PE, CEM, BPI-BA, BPI-MFBA, RESNET-Home Partner, RA, Refrigerating system operating engineer, High pressure boiler operating engineer, HEP-EA, HEP-QCI, Other	May be repeated for multiple contactors
B.2.8	State where qualification held	2-letter state abbreviation. Entities designated can include a state, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Commonwealth of the North Mariana Islands, the United States Virgin Islands, or any other territory or possession of the United States.		State code		May be repeated for multiple contactors
B.2.9	Years of experience			Number		May be repeated for multiple contactors

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B.2.10	Prefix			Text		May be repeated for multiple contactors
B.2.11	First name			Text		May be repeated for multiple contactors
B.2.12	Middle name			Text		May be repeated for multiple contactors
B.2.13	Last name			Text		May be repeated for multiple contactors
B.2.14	Suffix			Text		May be repeated for multiple contactors
B.2.15	Telephone type			Enumeration	Day, Evening, Mobile	May be repeated for multiple contactors
B.2.16	Telephone number			Text		May be repeated for multiple contactors
B.2.17	Is telephone the preferred contact method?			Boolean		May be repeated for multiple contactors
B.2.18	Telephone extension			Text		May be repeated for multiple contactors
B.2.19	Email type			Enumeration	Personal, Work, Other	May be repeated for multiple contactors
B.2.20	Email address			Text		May be repeated for multiple contactors
B.2.21	Is email the preferred contact method?			Boolean		May be repeated for multiple contactors
B.2.22	Address type	Indicate if street or mailing address		Enumeration	Street, Mailing	Indicate if street or mailing address
B.2.23	Address 1	Street or other address, including street number, street name, apartment number, and any other identifiers		Text		
B.2.24	Address 2	Street or other address, including street number, street name, apartment number, and any other identifiers		Text		
B.2.25	City or municipality	The city in which the site is located		Text		

ANNEX B.2 CONTRACTOR INFORMATION

B.2.26	State	2-letter state abbreviation. Entities designated can include a state, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Commonwealth of the North Mariana Islands, the United States Virgin Islands, or any other territory or possession of the United States.		State code		
B.2.27	Zip code	The United States Postal Service postal code where the Site is located. This can be defined as the standard 5 number postal code, or it can have the additional 4 number code separated by a hyphen.		Number		

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.1 SITE AND BUILDING ENVELOPE INFORMATION

	Data element	Definition	Units	Data type	Enumeration	Notes
B.3.1.1	Site type	Rural is defined as a place having fewer than 2,500 inhabitants; or a county or parish with an urban population of 20,000 inhabitants or less; or any place with a population not in excess of 20,000 inhabitants and not located in a Metropolitan Statistical Area (Rural Housing and Economic Development, www.HUD.gov)		Enumeration	Rural, Suburban, Urban	
B.3.1.2	Surroundings			Enumeration	Stand-alone, Attached on one side, Attached on two sides, Attached on three sides	
B.3.1.3	Vertical Surroundings			Enumeration	Unit above, Unit below, unit above and below, No units above or below	
B.3.1.4	Shielding of home			Enumeration	Well-shielded, Normal, Exposed	
B.3.1.5	Orientation of the front of home			Enumeration	North, Northwest, West, Southwest, South, Southeast, East, Northeast	
B.3.1.6	Azimuth of front of home			Number		
B.3.1.7	Distance from subway		Linear feet	Number		
B.3.1.8	Distance from bus		Linear feet	Number		
B.3.1.9	Distance from train		Linear feet	Number		

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B.3.1.10	Walk score	A walkability index based on the time it takes to walk from the property to nearby essentials such as grocery stores, schools, churches, etc. See www.walkscore.com for more information and requirements for using Walk Score.		Number		
B.3.1.11	Walk score source			Text		
B.3.1.12	Household type			Enumeration	Family household, Married couple, no children, Male household, no spouse, Female household, no spouse, Nonfamily household, Single male, Single female, Other	
B.3.1.13	Year occupied	The year the current occupants moved into the building	Year	Number		
B.3.1.14	Resident population type			Enumeration	No specific resident population, Student, Military, Senior, Special accessibility needs, Young children, At risk, Other	
B.3.1.15	Building occupancy			Enumeration	Owner-occupied, Renter-occupied, Owner-and-renter-occupied	
B.3.1.16	Number of residents			Number		Supports a non-integer and zero number of residents
B.3.1.17	Number of adults	Adults aged 18 or older		Number		

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B.3.1.18	Number of children			Number		
B.3.1.19	Publicly subsidized	Housing that receives or has received public funding for construction or operations (this does not include Section 8 or similar vouchers received by individual tenants)		Boolean		
B.3.1.20	Low Income	Household at or below the federal poverty level http://www.liheap.ncat.org/profiles/povertytables/FY2013/popstate.htm)		Boolean		
B.3.1.21	Occupant income range			Fraction		
B.3.1.22	Percent area median income			Fraction		
B.3.1.23	Percent federal poverty level			Fraction		
B.3.1.24	Highest level of occupant education			Enumeration	No high school, Some high school, High school graduate, Some college, Vocational or technical or associates degree, Bachelor's degree, Some post graduate, Master's degree, Professional degree, Doctoral degree	
B.3.1.25	Year built		Year	Number		
B.3.1.26	Year built known or estimated			Enumeration	Known, Estimated	

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B.3.1.27	Year of last remodel	For a remodel to be considered major, the work undertaken must have required a permit from the building department, or an inspection by a governing authority	Year	Number		
B.3.1.28	Residential facility type			Enumeration	Single-family detached, Single-family attached, Manufactured home, 2-4 unit building, 5+ unit building, Multi-family - uncategorized, Multi-family - town homes, Multi-family condos, Apartment unit, Studio unit, Other, Unknown	
B.3.1.29	Passive solar	Passive solar design—also known as climatic design—involves using a building's windows, walls, and floors to collect, store, and distribute solar energy in the form of heat in the winter and reject solar heat in the summer. (http://www.eere.energy.gov/basics/buildings/passive_solar_design.html)		Boolean		
B.3.1.30	Building height	Height above ground of a building	Linear feet	Number		
B.3.1.31	Number of units			Number		

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B.3.1.32	Number of floors	Number of surfaces of a building that are horizontal or near horizontal and form the bottom surface of a space (conditioned or unconditioned)		Number		
B.3.1.33	Number of conditioned floors	Number of floors that are heated or cooled, including the basement if heated or cooled (see conditioned floor area for definition)		Number		
B.3.1.34	Number of conditioned floors above grade	Number of floors above grade that are heated or cooled		Number		
B.3.1.35	Average ceiling height	Distance between floor and ceiling	Linear feet	Number		
B.3.1.36	Floor-to-floor height	Distance between floors	Linear feet	Number		

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B.3.1.37	Number of rooms	A room is a subdivision of a housing unit. Rooms include living rooms, dining rooms, bedrooms, kitchens, lodgers' rooms, finished basements or attic rooms, recreation rooms, and permanently enclosed sun porches that are used year round. Rooms used for offices by a person living in the unit are included. Bathrooms, halls, foyers or vestibules, balconies, closets, alcoves, pantries, strip or Pullman kitchens, laundry or furnace rooms, unfinished attics or basements, open porches, and unfinished space used for storage are NOT considered rooms. A partially divided room, such as a dinette next to a kitchen or a living room, is considered a separate room only if there is a partition from floor to ceiling, but not if the partition consists solely of shelves or cabinets. If occupants of more than one unit use a room, the room is included with the unit from which it is most easily reached.		Number		
B.3.1.38	Number of bedrooms	A bedroom is a room that is intended for sleeping, even if not presently used for sleeping. A one-room efficiency or studio apartment has no bedrooms.		Number		

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.1.39	Number of bathrooms			Number		
B.3.1.40	Number of full bathrooms	Bathrooms that have a tub or shower		Number		
B.3.1.41	Building footprint area	Building footprint is the area on a project site used by the building structure, defined by the perimeter of the building plan. Parking lots, parking garages, landscapes, and other non-building facilities are not included in the building footprint (http://www.leeduser.com/glossary/term/4695).	Square feet	Number		
B.3.1.42	Footprint shape	General shape of the premises outlined by the exterior walls		Enumeration	Rectangular, Square, Circular, L-shaped, U-shaped, I-shaped, V-shaped, Other	

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.1.43	Gross floor area	Gross floor area is the sum of the floor areas of the spaces within the building, including basements, mezzanine and intermediate-floored tiers, and penthouses with the headroom height of 7.5 ft. (2.2 meters) or greater. Measurements must be taken from the exterior faces of exterior walls OR from the centerline of walls separating buildings, OR from the centerline of walls separating spaces. Excludes non-enclosed (or non-enclosable) roofed-over areas such as exterior covered walkways, porches, terraces or steps, roof overhangs, and similar features. Excludes airshafts, pipe trenches, and chimneys. Excludes floor area dedicated to the parking and circulation of motor vehicles (ASHRAE).	Square feet	Number		

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.1.44	Net floor area	Net occupiable floor area: the floor area of an occupiable space defined by the inside surfaces of its walls but excluding shafts, column enclosures, and other permanently enclosed, inaccessible, and un-occupiable areas. Obstructions in the space such as furnishings, display or storage racks, and other obstructions, whether temporary or permanent, may not be deducted from the space are considered to be part of the net occupiable area (ANSI/ASHRAE Standard 62.1-2007)	Square feet	Number		
B.3.1.45	Conditioned floor area	All finished space that is within the (insulated) conditioned space boundary (i.e., within the insulated envelope), regardless of HVAC configuration (RESNET Formal Interpretation 2010-02 http://www.resnet.us/standards/Floor_Area_Interpretation.pdf)	Square feet	Number		

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B.3.1.46	Finished floor area	An enclosed area in a house that is suitable for year-round use, embodying walls, floors, and ceilings that is similar to the rest of the house (RESNET Formal Interpretation 2010-02 http://www.resnet.us/standards/Floor_Area_Interpretation.pdf)	Square feet	Number		
B.3.1.47	Number of stories above grade			Number		
B.3.1.48	Cooled floor area	The total area of all enclosed spaces measured to the internal face of the external walls. Included are areas of sloping surfaces such as staircases, galleries, raked auditoria, and tiered terraces where the area taken is from the area on the plan. Excluded are areas that are not enclosed such as open floors, covered ways and balconies.	Square feet	Number		

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B.3.1.49	Heated floor area	The total area of all enclosed spaces measured to the internal face of the external walls. Included are areas of sloping surfaces such as staircases, galleries, raked auditoria, and tiered terraces where the area taken is from the area on the plan. Excluded are areas that are not enclosed such as open floors, covered ways and balconies.	Square feet	Number		

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.1.50	Unconditioned floor area	An enclosed space within a building that does not meet the requirements of a conditioned space. Spaces that have no control over thermal conditions but intentionally or unintentionally receive thermal energy from adjacent spaces are considered unconditioned spaces (such as an attached garage on a house or a vestibule with no thermal comfort criteria). Spaces that are ventilated only to maintain air quality are considered unconditioned spaces (such as a parking garage with no thermal comfort criteria) (Standard Definitions of Building Geometry for Energy Evaluation, http://www.nrel.gov/docs/fy06osti/38600.pdf).	Square feet	Number		

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.1.51	Building volume	A volume of a building surrounded by solid surfaces such as walls, roofs, floors, fenestration, and doors where the total opening area to the outside can be reduced to less than 1% of the Gross Interior Floor Area of the space. Spaces that are temporarily enclosed, such as patios enclosed with tenting, are not considered Enclosed Spaces for annual building analysis. These spaces should be treated as exterior to the building (Standard Definitions of Building Geometry for Energy Evaluation, http://www.nrel.gov/docs/fy06osti/38600.pdf).	Cubic feet	Number		

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.1.52	Conditioned building volume	Volume inside the building envelope of the conditioned spaces. This metric can be calculated as the volume of the building if every space is conditioned or on a floor-by-floor basis. For spaces with vertical walls and horizontal ceilings and floors, this is calculated as the Gross Conditioned Floor Area times the height from the top surface of the finished floor to the top surface of the finished floor separating levels of the building or to the inside surface of the roof for the top floor. The volume of spaces that have non-vertical walls or non-horizontal ceilings of floors should be calculated separately to properly account for the non-rectangular geometry. This metric does include the volume of floor or ceiling return air plenums (Standard Definitions of Building Geometry for Energy Evaluation, http://www.nrel.gov/docs/fy06osti/38600.pdf).	Cubic feet	Number		
B.3.1.53	Foundation type			Enumeration	Basement (Finished, Conditioned); Crawlspace (Vented or Conditioned); Slab on grade; Garage (Conditioned); Above apartment; Combination; Ambient; Rubble stone; Other)	

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B.3.1.54	Thermal boundary			Enumeration	Frame floor, Foundation wall	
B.3.1.55	Attic type			Enumeration	Cape cod, Cathedral ceiling, Flat roof, Unvented attic, Vented attic, Venting unknown, Other	
B.3.1.56	Average attic R value			Number		
B.3.1.57	Average wall R value			Number		
B.3.1.58	Average floor R value			Number		
B.3.1.59	Average duct R value			Number		
B.3.1.60	Garage present			Boolean		
B.3.1.61	Garage location			Enumeration	Basement, First floor, Detached	
B.3.1.62	Space above garage			Enumeration	Conditioned area, Unconditioned attic, Crawlspace	

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.1.63	Energy score type	The Home Energy Rating System (HERS) index is a measure of a home's energy efficiency. It can also be used to inspect and calculate a home's energy performance. The lower a home's HERS Index Score, the greater its efficiency (RESNET). The Home Energy Score is an asset rating for homes, developed and administered by the U.S. Department of Energy. After conducting a brief walk thru of a home, a qualified assessor calculates a home's score on a 10 point scale using a standard scoring tool, with 10 reflecting homes that use the least amount of energy assuming standard operating conditions (US DOE).		Enumeration	RESNET, U.S. DOE, Other	
B.3.1.64	Other score type	Name of the score type if “other” is selected in Score Type		Text		
B.3.1.65	Score date			Date		
B.3.1.66	Energy score			Number		
B.3.1.67	Climate zone DOE			Enumeration	Subarctic, Marine, Hot-dry, Mixed-dry, Hot-humid, Mixed-humid, Cold, Very cold	
B.3.1.68	Climate zone IECC year			Enumeration	2012, 2009, 2006, 2003	

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B.3.1.69	Climate zone IECC			Enumeration	1A, 1B, 1C, 2A, 2B, 2C, 3A, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 5C, 6A, 6B, 6C, 7, 8	
B.3.1.70	Radon zone			Number		
B.3.1.71	Termite zone			Enumeration	None to slight, Slight to moderate, Moderate to heavy, Very heavy	
B.3.1.72	Hurricane zone			Boolean		
B.3.1.73	Flood zone			Boolean		
B.3.1.74	Earthquake zone			Boolean		
B.3.1.75	Weather station name			Text		Weather location used in model simulation and/or utility bill regression analysis
B.3.1.76	Weather station city			Text		Weather location used in model simulation and/or utility bill regression analysis
B.3.1.77	Weather station state			State code		Weather location used in model simulation and/or utility bill regression analysis
B.3.1.78	WBAN			Text		Weather location used in model simulation and/or utility bill regression analysis
B.3.1.79	Weather station type			Enumeration	TMY, TMY2, TMY3, Other	Weather location used in model simulation and/or utility bill regression analysis
B.3.1.80	Weather station use			Enumeration	Billing analysis, Energy modeling	
B.3.1.81	Zone name			Text		
B.3.1.82	Zone type			Enumeration	Conditioned, Unconditioned	
B.3.1.83	Space name			Text		
B.3.1.84	Number of bedrooms			Number		
B.3.1.85	Floor area		Square feet	Number		

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.1.86	Volume		Cubic feet	Number		
B.3.1.87	Ceiling height		Linear feet	Number		

B.3.2 AIR INFILTRATION

B.3.2.1	Air infiltration measurement date			Date		
B.3.2.2	Business conducting infiltration test			System identifier		
B.3.2.3	Individual conducting test			System identifier		
B.3.2.4	Outside temperature		Degrees Fahrenheit	Number		
B.3.2.5	Wind conditions			Enumeration	Windy, Normal	
B.3.2.6	Type of infiltration measurement			Enumeration	Blower door, Tracer gas, Estimate, Checklist	
B.3.2.7	Type of blower door test			Enumeration	Pressurization, Depressurization	
B.3.2.8	House pressure	House pressure number must be positive.	Pa	Number		
B.3.2.9	Fan pressure		Pa	Number		
B.3.2.10	Fan ring used			Enumeration	Open, A, B	
B.3.2.11	Building leakiness description			Enumeration	Very tight, Tight, Average, Leaky, Very leaky	
B.3.2.12	Building air leakage unit			Enumeration	CFM, CFMnatural, ACH, ACHnatural	
B.3.2.13	Building air leakage			Number		
B.3.2.14	Effective leakage area		Square inches	Number		
B.3.2.15	Air sealing hours		Hours	Number		

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B.3.2.16	Attic areas air sealed			Enumeration	Attic floor, top plates, attic kneewall transitions, plumbing wet walls, chimney/flue chases, recessed lights, attic access, dropped soffit, attic level transitions, mechanical chases, other	
B.3.2.17	Basement/crawlspace areas air sealed			Enumeration	Plumbing penetrations, access, wiring penetrations, chimney/flue chase, mechanical chases, rim joists, windows and doors, foundation service penetrations, cantilevers, other	
B.3.2.18	Living space areas air sealed			Enumeration	Home-garage connection, rim joists, baseboards, windows and doors, plumbing penetrations, HVAC registers, interior sheathing voids, cantilevers, other	
B.3.3 ATTIC AND ROOF						
B.3.3.1	Roof color			Enumeration	Light, Medium, Dark, Reflective	

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B.3.3.2	Roof type			Enumeration	Shingles, Slate or tile shingles, Wood shingles or shakes, Asphalt or fiberglass shingles, Metal surfacing, Expanded polystyrene sheathing, Plastic/rubber/synthetic sheeting, Concrete, Cool roof, Green roof, No one major type, Other	
B.3.3.3	Deck type			Enumeration	Concrete, Metal, Wood, Other	
B.3.3.4	Roof pitch			Fraction		
B.3.3.5	Roof area		Square feet	Number		
B.3.3.6	Radiant barrier			Boolean	Radiant barriers are installed in homes, usually in attics, to reduce summer heat gain and reduce cooling costs. The barriers consist of a highly reflective material that reflects radiant heat rather than absorbing it.	
B.3.3.7	Radiant barrier location			Enumeration	Top side of truss under sheathing, Below bottom cord of truss, Attic floor, Underside of rafters, Other	
B.3.3.8	Attached to space	Use to indicate space under the attic		System identifier		
B.3.3.9	Attached to roof			System identifier		

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.3.10	Attic exterior adjacent to			Enumeration	Ambient, Garage, Attic, Crawlspace, Ground, Living space, Unconditioned basement, Other	
B.3.3.11	Attic interior adjacent to			Enumeration	Ambient, Garage, Attic, Crawlspace, Ground, Living space, Unconditioned basement, Other	
B.3.3.12	Attic knee wall			Enumeration		
B.3.3.13	Attic type			Enumeration	Cape cod, Cathedral ceiling, Flat roof, Unvented attic, Vented attic, Venting unknown, Other	
B.3.3.14	Surface area		Square feet	Number		
B.3.3.15	Stud size (rafters)			Enumeration	2x2, 2x4, 2x6, 2x8, 2x10, 2x12, 2x14, 2x16, Other	
B.3.3.16	Spacing (rafters)		Inches	Number		
B.3.3.17	Framing factor (rafters)			Fraction		
B.3.3.18	Stud material (rafters)			Enumeration	Wood, Metal	

B.3.4 FOUNDATION

B.3.4.1	Foundation type			Enumeration	Basement (Finished, Conditioned); Crawlspace (Vented or Conditioned); Slab on grade; Garage (Conditioned); Above apartment; Combination; Ambient; Rubble stone; Other)	
B.3.4.2	Thermal boundary			Enumeration	Frame floor, Foundation wall	
B.3.4.3	Stud size			Enumeration	2x2, 2x4, 2x6, 2x8, 2x10, 2x12, 2x14, 2x16 Other	May be repeated for floor joists, floor trusses, and interior studs

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.4.4	Spacing		Inches	Number		May be repeated for floor joists, floor trusses, and interior studs
B.3.4.5	Framing factor			Fraction		May be repeated for floor joists, floor trusses, and interior studs
B.3.4.6	Stud material			Enumeration	Wood, metal	May be repeated for floor joists, floor trusses, and interior studs
B.3.4.7	Floor covering			Enumeration	Carpet, Tile, Hardwood, Vinyl	May be repeated for frame floor and slab
B.3.4.8	Area		Square feet	Number		May be repeated for frame floor, slab and foundation wall.
B.3.4.9	Insulation grade			Number		May be repeated for frame floor, foundation wall, perimeter, and under slab insulation
B.3.4.10	Insulation condition			Enumeration	Good, Fair, Poor	May be repeated for frame floor, foundation wall, perimeter, and under slab insulation
B.3.4.11	Insulation location			Enumeration	Interior, Exterior	May be repeated for frame floor, foundation wall, perimeter, and under slab insulation
B.3.4.12	Assembly effective R-value	Indicate the effective R-value of the complete assembly including any air films or other treatments	R-value	Number		May be repeated for frame floor, foundation wall, perimeter, and under slab insulation
B.3.4.13	Misaligned insulation			Boolean		May be repeated for frame floor, foundation wall, perimeter, and under slab insulation
B.3.4.14	Insulation type			Enumeration	Cavity, Continuous	May be repeated for frame floor, foundation wall, perimeter, and under slab insulation

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B.3.4.15	Insulation material			Enumeration	Batt (Fiberglass, Rockwool, Recycled cotton, Loose fill, Unknown); Loose fill (Cellulose, Fiberglass, Rockwool, Vermiculite, Unknown); Rigid (Rigid Polyisocyanurate, XPS, Expanded Polystyrene, Unknown); Spray foam (Open Cell, Closed Cell, Unknown); Other (Describe); Unknown	May be repeated for frame floor, foundation wall, perimeter, and under slab insulation
B.3.4.16	Insulation nominal R-value			Number		May be repeated for frame floor, foundation wall, perimeter, and under slab insulation
B.3.4.17	Insulation thickness		Inches	Number		May be repeated for frame floor, foundation wall, perimeter, and under slab insulation
B.3.4.18	Foundation wall type			Enumeration	Solid concrete, Concrete block, Concrete block foam core, Concrete block vermiculite core, Double brick, Wood	
B.3.4.19	Length	Length of foundation wall	Linear feet	Number		
B.3.4.20	Height	Height of foundation wall	Linear feet	Number		
B.3.4.21	Thickness	Thickness of foundation wall excluding interior framing	Inches	Number		
B.3.4.22	Below grade depth	Depth below grade of the foundation wall	Linear feet	Number		
B.3.4.23	Adjacent to foundation					Use this system identifier to indicate if foundation wall is adjacent to another foundation

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B.3.4.24	Adjacent to			Enumeration	Ambient, Garage, Attic, Crawlspace, Ground, Living space, Unconditioned basement, Other housing unit, Other	
B.3.4.25	Perimeter	Length of slab perimeter	Linear feet	Number		
B.3.4.26	Exposed perimeter	Perimeter of the slab exposed to ambient conditions	Linear feet	Number		
B.3.4.27	Perimeter insulation depth	Depth from grade to bottom of vertical slab perimeter insulation	Linear feet	Number		
B.3.4.28	Under slab insulation width		Inches	Number		
B.3.4.29	On grade exposed perimeter	Perimeter of slab that is on-grade (2ft. Below grade or less) and exposed to ambient conditions	Linear feet	Number		
B.3.4.30	Depth below grade	Depth from the top of the slab surface to grade	Linear feet	Number		

B.3.5 RIM JOISTS

B.3.5.1	Attached to space			System identifier		
B.3.5.2	Exterior adjacent to			Enumeration	Ambient, Garage, Attic, Crawlspace, Ground, Living space, Unconditioned basement, Other housing unit, Other	
B.3.5.3	Interior adjacent to			Enumeration	Ambient, Garage, Attic, Crawlspace, Ground, Living space, Unconditioned basement, Other housing unit, Other	
B.3.5.4	Area		Square feet	Number		
B.3.5.5	Insulation grade			Number		
B.3.5.6	Insulation condition			Enumeration	Good, Fair, Poor	

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B.3.5.7	Insulation location			Enumeration	Interior, Exterior	
B.3.5.8	Assembly effective R-value	Indicate the effective R-value of the complete assembly including any air films or other treatments	R-value	Number		
B.3.5.9	Misaligned insulation			Boolean		
B.3.5.10	Insulation type			Enumeration	Cavity, Continuous	
B.3.5.11	Insulation material			Enumeration	Batt (Fiberglass, Rockwool, Recycled cotton, Loose fill, Unknown); Loose fill (Cellulose, Fiberglass, Rockwool, Vermiculite, Unknown); Rigid (Rigid Polyisocyanurate, XPS, Expanded Polystyrene, Unknown); Spray foam (Open Cell, Closed Cell, Unknown); Other (Describe); Unknown	
B.3.5.12	Insulation nominal R-value			Number		
B.3.5.13	Insulation thickness		Inches	Number		
B.3.5.14	Size (floor joists)			Enumeration	2x2, 2x4, 2x6, 2x8, 2x10, 2x12, 2x14, 2x16, Other	
B.3.5.15	Spacing (floor joists)		Inches	Number		
B.3.5.16	Framing factor (floor joists)			Fraction		
B.3.5.17	Stud material (floor joists)			Enumeration	Wood, metal	
			B.3.6 WALLS			
B.3.6.1	Attached to space			System identifier		

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B.3.6.2	Exterior adjacent to			Enumeration	Ambient, Garage, Attic, Crawlspace, Ground, Living space, Unconditioned basement, Other housing unit, Other	
B.3.6.3	Interior adjacent to			Enumeration	Ambient, Garage, Attic, Crawlspace, Ground, Living space, Unconditioned basement, Other housing unit, Other	
B.3.6.4	Wall type			Enumeration	Wood stud (Expanded Polystyrene Sheathing or Optimum value engineering); Double wood stud (Staggered); Concrete masonry unit; Structurally insulated panel; Insulated concrete forms; Steel frame; Solid concrete; Structural brick; Straw bale; Stone, Other	
B.3.6.5	Thickness	Thickness of the wall assembly	Inches	Number		
B.3.6.6	Surface area	Gross wall area	Square feet	Number		
B.3.6.7	Orientation			Enumeration	North, Northwest, West, Southwest, South, Southeast, East, Northeast	
B.3.6.8	Azimuth	Number between 0 and 360	Degrees	Number		
B.3.6.9	Size of studs			Enumeration	2x2, 2x4, 2x6, 2x8, 2x10, 2x12, 2x14, 2x16,Other	
B.3.6.10	Spacing		Inches	Number		
B.3.6.11	Framing factor	Percent of the total wall area occupied by framing members		Fraction		
B.3.6.12	Material			Enumeration	Wood, metal	

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B.3.6.13	Siding	Material, such as boards or shingles, used for surfacing the outside walls of a frame building		Enumeration	Wood siding, Stucco, Synthetic stucco, Vinyl siding, Aluminum siding, Brick veneer, Asbestos siding, Fiber cement siding, Composite shingle siding, Masonite siding, Other	
B.3.6.14	Wall color			Enumeration	Light, Medium, Dark, Reflective	
B.3.6.15	Insulation grade			Number		
B.3.6.16	Insulation condition			Enumeration	Good, Fair, Poor	
B.3.6.17	Insulation location			Enumeration	Interior, Exterior	
B.3.6.18	Assembly effective R-value	Indicate the effective R-value of the complete assembly including any air films or other treatments	R-value	Number		
B.3.6.19	Misaligned insulation			Boolean		
B.3.6.20	Insulation type			Enumeration	Cavity, Continuous	
B.3.6.21	Insulation material			Enumeration	Batt (Fiberglass, Rockwool, Recycled cotton, Loose fill, Unknown); Loose fill (Cellulose, Fiberglass, Rockwool, Vermiculite, Unknown); Rigid (Rigid Polyisocyanurate, XPS, Expanded Polystyrene, Unknown); Spray foam (Open Cell, Closed Cell, Unknown); Other (Describe); Unknown	
B.3.6.22	Insulation material			Enumeration	Unknown	
B.3.6.23	Insulation nominal R-value			Number		

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B.3.6.24	Insulation thickness		Inches	Number		

B.3.7 WINDOWS

B.3.7.1	Area	Total surface window area for this group of windows.	Square feet	Number		The Window element can be used to describe a single window or a group of windows with the same characteristics. For a group of windows, use the sum of the window areas in the Area sub-element.
B.3.7.2	Quantity	Number of windows in the group		Number		
B.3.7.3	Azimuth		Degrees	Number		
B.3.7.4	Orientation			Enumeration	North, Northwest, West, Southwest, South, Southeast, East, Northeast	
B.3.7.5	Frame type			Enumeration	Aluminum (Thermal break); Composite; Fiberglass; Metal; Vinyl; Wood; Other	
B.3.7.6	Glass layers			Enumeration	Single-pane, Double-pane, Triple-pane, Multi-layered, Single-paned with storms, Single-paned with low-e storms, Other	
B.3.7.7	Glass type			Enumeration	Low-e, Tinted, Reflective, Tinted/reflective, Other	
B.3.7.8	Gas fill			Enumeration	Air, Argon, Other	
B.3.7.9	Window treatments			Enumeration	Window film, Solar screen, Shading	
B.3.7.10	Window condition			Enumeration	Good, Moderate, Poor	

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B.3.7.11	U-factor	Rate of heat loss indicated in terms of the U-factor (U-value) of a window assembly. The lower the U-factor, the greater a window's resistance to heat flow and the better its insulating properties.		Number		
B.3.7.12	Solar heat gain coefficient (SHGC)			Fraction		
B.3.7.13	NFRC-certified			Boolean		
B.3.7.14	Third party certification	Independent organization has verified that product or appliance meets or exceeds the standard in question (ENERGY STAR, CEE, or other)		Enumeration	ENERGY STAR, Other	
B.3.7.15	Visible transmittance	Optical property that indicates the amount of visible light transmitted		Fraction		
B.3.7.16	Interior shading			Enumeration	Light blinds, Dark blinds, Light shades, Dark shades, Light curtains, Dark curtains, None	
B.3.7.17	Interior shading factor	A measure of the ability of a window or skylight to transmit solar heat, relative to that ability for 3 mm (1/8-inch) clear, double-strength, single glass. Shading coefficient is being phased out in favor of the solar heat gain coefficient (SHGC), and is approximately equal to the SHGC multiplied by 1.15.		Fraction		

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.7.18	Exterior shading type			Enumeration	External overhangs, Awnings, Solar screens, Solar film, Deciduous tree, Evergreen tree, Building, Other, None	
B.3.7.19	Depth of overhangs		Inches	Number		
B.3.7.20	Distance to top of window (overhangs)	Vertical distance from overhang to top of window	Inches	Number		
B.3.7.21	Distance to bottom of window (overhangs)	Vertical distance from overhang to bottom of window	Inches	Number		
B.3.7.22	Weather stripping			Boolean		
B.3.7.23	Operable			Boolean		
B.3.7.24	Movable window insulation R-value	Rigid opaque foam panels (permanently installed or not) or cellular shades that provide insulation.	R-value	Number		
B.3.7.25	Solar tube			Boolean		
B.3.7.26	Pitch			Fraction		

B.3.8 SKYLIGHTS

B.3.8.1	Area		Square feet	Number		The Skylight element can be used to describe a single skylight or a group of skylights with the same characteristics. For a group of skylights, use the sum of the skylight areas in the Area sub-element.
B.3.8.2	Quantity			Number		
B.3.8.3	Azimuth	Number between 0 and 360	Degrees	Number		
B.3.8.4	Orientation			Enumeration	North, Northwest, West, Southwest, South, Southeast, East, Northeast	

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.8.5	Frame type			Enumeration	Aluminum (Thermal break); Composite; Fiberglass; Metal; Vinyl; Wood; Other	
B.3.8.6	Glass layers			Enumeration	Single-pane, Double-pane, Triple-pane, Multi-layered, Single-paned with storms, Single-paned with low-e storms, Other	
B.3.8.7	Glass type			Enumeration	Low-e, Tinted, Reflective, Tinted/reflective, Other	
B.3.8.8	Gas fill			Enumeration	Air, Argon, Other	
B.3.8.9	Window treatments			Enumeration	Window film, Solar screen, Shading	
B.3.8.10	Window condition			Enumeration	Good, Moderate, Poor	
B.3.8.11	U-factor			Number		
B.3.8.12	Solar heat gain coefficient (SHGC)	Fraction of incident solar radiation admitted through a window, both directly transmitted and absorbed and subsequently released inward		Fraction		
B.3.8.13	NFRC-certified			Boolean		
B.3.8.14	Third party certification	Independent organization has verified that product or appliance meets or exceeds the standard in question (ENERGY STAR, CEE, or other)		Enumeration	ENERGY STAR, Other	
B.3.8.15	Visible transmittance			Fraction		
B.3.8.16	Interior shading			Enumeration	Light blinds, Dark blinds, Light shades, Dark shades, Light curtains, Dark curtains, None	

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.8.17	Interior shading factor			Fraction	A measure of the ability of a window or skylight to transmit solar heat, relative to that ability for 3 mm (1/8-inch) clear, double-strength, single glass. Shading coefficient is being phased out in favor of the solar heat gain coefficient (SHGC), and is approximately equal to the SHGC multiplied by 1.15.	
B.3.8.18	Exterior shading type			Enumeration	External overhangs, Awnings, Solar screens, Solar film, Deciduous tree, Evergreen tree, Building, Other, None	
B.3.8.19	Depth of overhangs		Inches	Number		
B.3.8.20	Distance to top of window (overhangs)	Vertical distance from overhang to top of window	Inches	Number		
B.3.8.21	Distance to bottom of window (overhangs)	Vertical distance from overhang to bottom of window	Inches	Number		
B.3.8.22	Weather stripping			Boolean		
B.3.8.23	Operable			Boolean		
B.3.8.24	Solar tube			Boolean		
B.3.8.25	Pitch			Fraction		

B.3.9 DOORS

B.3.9.1	Number of doors			Number		
B.3.9.2	Surface area		Square feet	Number		
B.3.9.3	Azimuth		Degrees	Number		

ANNEX B.3. SITE AND BUILDING ENVELOPE

B.3.9.4	Orientation			Enumeration	North, Northwest, West, Southwest, South, Southeast, East, Northeast	
B.3.9.5	Door type			Enumeration	Interior, Exterior, Storm	
B.3.9.6	Door material			Enumeration	Solid wood, Hollow wood, Non-insulated metal, Insulated metal, Glass	
B.3.9.7	Weather stripping			Boolean		
B.3.9.8	Storm door			Boolean		
B.3.9.9	R-Value			Number		
B.3.9.10	Third party certification	Independent organization has verified that product or appliance meets or exceeds the standard in question (ENERGY STAR, CEE, or other)		Enumeration	ENERGY STAR, Other	

ANNEX B.4 HVAC SYSTEMS

B.4.1 HVAC SYSTEM INFORMATION

	Data element	Definition	Units	Data type	Enumeration	Notes
B.4.1.1	Primary heating system identifier			System identifier		May be used to reference the primary system
B.4.1.2	Primary cooling system identifier			System identifier		May be used to reference the primary system
B.4.1.3	Unit location			Enumeration	Conditioned attic, Unconditioned attic, Conditioned basement, Unconditioned basement, Conditioned space, Vented crawlspace, Unvented crawlspace, Conditioned garage, Unconditioned garage, Mechanical closet, Other interior, Other exterior, Roof deck	May be repeated for heating, cooling, and heat pump systems
B.4.1.4	Year installed		Year	Number		May be repeated for heating, cooling, and heat pump systems
B.4.1.5	Model year		Year	Number		May be repeated for heating, cooling, and heat pump systems
B.4.1.6	Manufacturer			Text		May be repeated for heating, cooling, and heat pump systems

ANNEX B.4 HVAC SYSTEMS

B.4.2 HEATING SYSTEM

B.4.2.1	Heating system type			Enumeration	Furnace (Sealed combustion, Condensing system, Atmospheric burner, Power burner); Wall furnace (Sealed combustion, Atmospheric burner, Power burner); Boiler (Hot water, Steam, Sealed combustion, Condensing system, Atmospheric burner, Power burner, Rotary cup); Electric distribution (Baseboard, Radiant floor, Radiant ceiling); Fireplace; Stove; Portable heater; Solar thermal; District steam heat (1-pipe, 2-pipe, Other); Other	
B.4.2.2	Smoke emissions rate	From EPA label (for wood stoves and fireplaces)	Grams/hr	Number		
B.4.2.3	Heating capacity		Btuh	Number		
B.4.2.4	Fuel			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	

ANNEX B.4 HVAC SYSTEMS

B.4.2.5	Annual heating efficiency units			Enumeration	HSPF, COP, AFUE, Percent	
B.4.2.6	Annual heating efficiency value			Number		
B.4.2.7	Fraction of heating load served			Fraction		
B.4.2.8	Floor area served		Square feet	Number		

B.4.3 COOLING SYSTEM

B.4.3.1	Cooling system type			Enumeration	Central air conditioning, Mini-split, Room air conditioner, Evaporative cooler, Other	
B.4.3.2	Fuel			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	
B.4.3.3	Capacity		Btuh	Number		
B.4.3.4	Fraction of cooling load served			Fraction		
B.4.3.5	Floor area served		Square feet	Number		
B.4.3.6	Annual cooling efficiency units			Enumeration	SEER, EER, COP, kW/ton	
B.4.3.7	Annual cooling efficiency value			Number		
B.4.3.8	Sensible heat fraction			Fraction		

ANNEX B.4 HVAC SYSTEMS

B.4.4 HEAT PUMP

B.4.4.1	Heat pump type			Enumeration	Water-to-air, Water-to-water, Air-to-air, Mini-split, Ground-to-air	
B.4.4.2	Heating capacity		Btuh	Number		
B.4.4.3	Heating capacity (17 degrees Fahrenheit)		Btuh	Number		
B.4.4.4	Cooling capacity		Btuh	Number		
B.4.4.5	Cooling sensible heat fraction			Fraction		
B.4.4.6	Geothermal loop			Enumeration	Open, Closed, Direct expansion	
B.4.4.7	Backup system fuel			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	
B.4.4.8	Backup AFUE			Number		
B.4.4.9	Backup heating capacity		Btuh	Number		
B.4.4.10	Backup heating switchover temperature		Degrees Fahrenheit	Number		
B.4.4.11	Fraction heat load served			Fraction		
B.4.4.12	Fraction cool load served			Fraction		
B.4.4.13	Floor area served		Square feet	Number		
B.4.4.14	Annual cooling efficiency units			Enumeration	SEER, EER, COP, kW/ton	

ANNEX B.4 HVAC SYSTEMS

B.4.4.15	Annual cooling efficiency value			Number		
B.4.4.16	Annual heating efficiency units			Enumeration	HSPF, COP, AFUE, Percent	
B.4.4.17	Annual heating efficiency value			Number		

B.4.5 HVAC CONTROLS

B.4.5.1	Control type			Enumeration	Programmable thermostat, Manual thermostat, Digital thermostat, Timer, EMCS, Other	
B.4.5.2	Setpoint temperature heating season		Degrees Fahrenheit	Number	Actual setting used in the space when heating is required.	
B.4.5.3	Setback temperature heating season		Degrees Fahrenheit	Number	Temperature used at night, weekends and other holidays during the heating season.	
B.4.5.4	Total setback hours per week during heating season		Hours	Number		
B.4.5.5	Setup temperature cooling season		Degrees Fahrenheit	Number	Temperature used at night, weekends, and other holidays during the heating season.	
B.4.5.6	Setpoint temperature cooling season		Degrees Fahrenheit	Number	Actual setting used in the space when cooling is required.	
B.4.5.7	Total setup hours per week during cooling season		Hours	Number		
B.4.5.8	Hot water reset control			Enumeration	Seasonal, Other	
B.4.5.9	Heat lowered during day			Boolean		
B.4.5.10	Heat lowered during night			Boolean		
B.4.5.11	AC adjusted during day			Boolean		
B.4.5.12	AC adjusted during night			Boolean		

ANNEX B.4 HVAC SYSTEMS

B.4.5.13	Percent of rooms controlled by thermostatic radiator valves			Fraction		
B.4.5.14	Percent of rooms controlled by electronic zone valves with thermostats			Fraction		

B.4.6 HVAC DISTRIBUTION

B.4.6.1	Air distribution type			Enumeration	Regular velocity, High velocity, Gravity	
B.4.6.2	Air handler motor type			Enumeration	PSC single speed, PSC multi speed, ECM	
B.4.6.3	Air handler static pressure measurement	(Pa) Positive for supply side measurements, negative for return side	Pascals	Number		
B.4.6.4	Static pressure measurement location			Enumeration	In ducts, At equipment	
B.4.6.5	Static pressure source			Enumeration	As measured, Per design report, Per OEM documentation	
B.4.6.6	Leakiness observed through visual inspection			Enumeration	Connections sealed with mastic, No observable leaks, Some observable leaks, Significant leaks, Catastrophic leaks	
B.4.6.7	Duct leakage test method			Enumeration	Duct leakage tester, Blower door subtract, Pressure pan, Visual inspection	
B.4.6.8	Duct leakage test unit of measurement			Enumeration	CFM, CFM per Standard 152	
B.4.6.9	Measured duct leakage		CFM	Number		
B.4.6.10	Duct leakage measured to the outside or total			Enumeration	To outside, total	

B.4.6.11	Effective leakage area	The Leakage Area is defined in TECBLAST as the size of a sharp edged orifice, which would leak at the same flow rate as the measured leakage, if the orifice were subjected to the Test Pressure. Leakage Area [sq in] = Duct System Leakage Rate [CFM] / (1.06 * (Test Pressure [Pa]) ^ 0.5)	Square inches	Number		
B.4.6.12	Duct system sizing appropriate			Boolean		
B.4.6.13	Duct type			Enumeration	Supply, Return	
B.4.6.14	Duct material			Enumeration	Duct board, Sheet metal, Galvanized, Flexible, Fiberboard, Other	
B.4.6.15	Duct insulation R value			Number		
B.4.6.16	Duct insulation thickness		Inches	Number		
B.4.6.17	Duct insulation condition			Enumeration	Good, Fair, Poor	
B.4.6.18	Duct surface area	If a Duct Type of supply or return is specified above, this is the fraction of the supply or return duct area. If Duct Type is omitted above, this is the fraction of the total duct area.		Number		
B.4.6.19	Duct location			Enumeration	Conditioned space, Unconditioned space, Unconditioned basement, Unvented crawlspace, Vented crawlspace, Unconditioned attic, Interstitial space, Garage, Outside	

B.4.6.20	Number of return registers			Number		
B.4.6.21	Percent of pipe insulated			Fraction		
B.4.6.22	Pipe R-value		R-value	Number		
B.4.6.23	Hydronic distribution type			Enumeration	Radiator, Baseboard, Radiant floor, Radiant ceiling, Other	
B.4.6.24	System pump and zone valve corrections made			Boolean		
B.4.6.25	Thermostatic radiator valves			Boolean		
B.4.6.26	Variable speed pump			Boolean		
B.4.6.27	Other distribution type			Text		
B.4.6.28	Conditioned floor area served	Conditioned floor area that this distribution system serves	Square feet	Number		
B.4.6.29	Annual heating distribution system efficiency	For software that does not calculate annual distribution system efficiency (DSE) for heating, the DSE may be approximated by equation 3.4.i in ANSI/BPI-2400-S-2012: Standard Practice for Standardized Qualification of Whole-House Energy Savings, Predictions by Calibration to Energy Use History.		Number		

ANNEX B.4 HVAC SYSTEMS

B.4.6.30	Annual cooling distribution system efficiency	For software that does not calculate annual distribution system efficiency (DSE) for cooling, the DSE may be approximated by equation 3.4.i in ANSI/BPI-2400-S-2012: Standard Practice for Standardized Qualification of Whole-House Energy Savings Predictions by Calibration to Energy Use History.		Number		
B.4.6.31	Duct system sealed			Boolean		
B.4.6.32	Duct system sealed year/month	The year and month the duct system was sealed		YearMonth		
B.4.6.33	Duct outside envelope insulated as part of retrofit			Boolean		
B.4.6.34	Duct system replaced			Boolean		
B.4.6.35	System pump and zone valve corrections made			Boolean		

ANNEX B.4 HVAC SYSTEMS

B.4.7 HVAC MAINTENANCE

B.4.7.1	Tune and repair			Boolean		May be repeated for heating, cooling, and heat pump systems
B.4.7.2	Tune and repair year/month	Year and month of the last HVAC tune-up and repair for this HVAC equipment		YearMonth		
B.4.7.3	Schedule			Enumeration	None, Yes (Unspecified, As needed, Daily, Weekly, Bi-weekly, Monthly, Semi-quarterly, Quarterly, Semi-annually, Annually)	
B.4.7.4	AC replaced in last 10 years			Boolean		
B.4.7.5	Number of coils replaced			Number		May be repeated for heating, cooling, and heat pump systems
B.4.7.6	Number of air handlers replaced			Number		May be repeated for heating, cooling, and heat pump systems
B.4.7.7	Air filter size (width)		Inches	Number		
B.4.7.8	Air filter size (length)		Inches	Number		
B.4.7.9	Air filter size (thickness)		Inches	Number		
B.4.7.10						
B.4.7.11	MERV rating	Minimum efficiency reporting value, commonly known as MERV rating, is a measurement scale designed in 1987 by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) to rate the effectiveness of air filters.		Number		
B.4.7.12	When was the filter last replaced?	The year and month the filter was last replaced		YearMonth		

ANNEX B.5 MECHANICAL AND COMBUSTION VENTILATION

	Data element	Definition	Units	Data type	Enumeration	Notes
B.5.1	Manufacturer			Text		
B.5.2	Serial number			Text		
B.5.3	Fan type			Enumeration	Exhaust only, Supply only, Heat recovery ventilator, Energy recovery ventilator	
B.5.4	Rated flow rate		CFM	Number		
B.5.5	Calculated flow rate	Using a prescriptive approach to calculate duct size	CFM	Number		
B.5.6	Tested flow rate		CFM	Number		
B.5.7	Hours in operation		Hours	Number		
B.5.8	Delivered ventilation		CFM	Number		
B.5.9	Fan control properly labeled			Enumeration	True, False, n/a	
B.5.10	Fan properly vented	Considers duct length, duct size, excessive duct turns, ducts vent to outdoors, and/or duct connections are well sealed and durable		Enumeration	True, False, n/a	
B.5.11	Fan location			Enumeration	Bath, Kitchen, Hallway, Garage, Other	
B.5.12	Used for local ventilation			Boolean		
B.5.13	Used for whole building ventilation			Boolean		
B.5.14	Used for seasonal cooling load reduction			Boolean		

ANNEX B.5 MECHANICAL AND COMBUSTION VENTILATION

B.5.15	Used for garage ventilation			Boolean		
B.5.16	Rated noise	May be taken from manufacturer's information	Sones	Number		
B.5.17	Tested noise	As tested in the field	Sones	Number		
B.5.18	Total recovery efficiency	The net total energy (sensible plus latent, also called enthalpy) recovered by the supply airstream adjusted by electric consumption, case heat loss or heat gain, air leakage and airflow mass imbalance between the two airstreams, as a percent of the potential total energy that could be recovered plus the exhaust fan energy. Values for some products can be found at the Home Ventilating Institute (hvi.org).		Fraction		

ANNEX B.5 MECHANICAL AND COMBUSTION VENTILATION

B.5.19	Sensible recovery efficiency	The net sensible energy recovered by the supply airstream as adjusted by electric consumption, case heat loss or heat gain, air leakage, airflow mass imbalance between the two airstreams and the energy used for defrost (when running the Very Low Temperature Test), as a percent of the potential sensible energy that could be recovered plus the exhaust fan energy. Values for some products can be found at the Home Ventilating Institute (hvi.org).		Fraction		
B.5.20	Fan power		Watts	Number		
B.5.21	Venting system type			Enumeration	Atmospheric, Induced draft, Power vented (at unit), Power vented (at exterior), Direct vented, Sealed combustion	

ANNEX B.6 WATER HEATING

	Data element	Definition	Units	Data type	Enumeration	Notes
B.6.1	Fuel type			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	
B.6.2	Water heater type			Enumeration	Storage water heater, Dedicated boiler w storage tank, Instantaneous water heater, Heat pump water heater, Space-heating boiler with storage tank, Space-heating boiler with tankless coil	
B.6.3	Has geothermal desuperheater element	Indicates whether this water heater has a geothermal desuperheater. The attached heat pump can be referenced in the Related Heating System element.		Boolean		
B.6.4	Year installed			Number		
B.6.5	Model year			Number		
B.6.6	Manufacturer			Text		

ANNEX B.6 WATER HEATING

B.6.7	Model number			Text		
B.6.8	AHRI Number			Number		
B.6.9	Serial number			Text		
B.6.10	Location			Enumeration	Conditioned attic, Unconditioned attic, Conditioned basement, Unconditioned basement, Conditioned space, Vented crawlspace, Unvented crawlspace, Conditioned garage, Unconditioned garage, Mechanical closet, Other interior, Other exterior, Roof deck	
B.6.11	Performance adjustment			Fraction		
B.6.12	Third party certification	Independent organization has verified that product or appliance meets or exceeds the standard in question (ENERGY STAR, CEE, or other)		Enumeration	ENERGY STAR, CEE Tier 1, CEE Tier 2, CEE Tier 3, Other	
B.6.13	Tank volume		Gallons	Number		
B.6.14	Fraction DHW load served			Fraction		
B.6.15	Heating capacity		Btuh	Number		

ANNEX B.6 WATER HEATING

B.6.16	Energy factor	The amount of energy delivered as heated water in a day divided by the total daily energy consumption of a residential water heater, as determined following standardized DOE testing procedure		Fraction		
B.6.17	First hour rating	An estimate of the maximum volume of hot water in gallons that a storage water heater can supply within an hour that begins with the water heater fully heated.	Gal/minute	Number		
B.6.18	Gallons per minute	The amount of gallons per minute of hot water that can be supplied by an instantaneous water heater while maintaining a nominal temperature rise of 77°F during steady state operation.	Gal/minute	Number		
B.6.19	Thermal efficiency	Ratio of square feet required for collector to heat water	Btu/(ft2day) rating	Number		
B.6.20	Recovery efficiency	The ratio of energy delivered to heat cold water compared to the energy consumed by the water heater, as determined following standardized DOE testing procedure		Fraction		
B.6.21	Jacket R value			Number		

ANNEX B.6 WATER HEATING

B.6.22	Meets ACCA 5 QI HVAC specification			Boolean		
B.6.23	Hot water temperature		Degrees Fahrenheit	Number		
B.6.24	Has shared combustion ventilation			Boolean		
B.6.25	Combustion ventilation system orphaned			Boolean		
B.6.26	Installation standard			Enumeration	ACCA 5 QI HVAC, Other	
B.6.27	Jacket installed indicator			Boolean		
B.6.28	Existing system disposed			Boolean		
B.6.29	Description of repairs			Text		
B.6.30	System replaced			Boolean		
B.6.31	Distribution system type			Enumeration	Standard, recirculation	Distribution system type
B.6.32	Standard system piping length	Length of measurement of piping in standard distribution systems	Feet	Number		Standard system piping length
B.6.33	Recirculation control type			Enumeration	No control, Timer, Temperature, Presence sensor demand control, manual demand control	Recirculation control type
B.6.34	Recirculation piping loop length	Length of measurement	Feet	Number		Recirculation piping loop length
B.6.35	Branch piping loop length	Length of measurement	Feet	Number		Branch piping loop length
B.6.36	Pump power		Watts	Number		
B.6.37	Pipe insulated			Boolean		
B.6.38	Pipe insulation R-value		R-value	Number		
B.6.39	Length of pipe insulated		Feet	Number		

ANNEX B.6 WATER HEATING

B.6.40	Fraction of pipe insulated		Feet	Percent		
B.6.41	Water fixture type			Enumeration	Faucet, Shower head, Other	
B.6.42	Attached to heating system			System identifier		
B.6.43	Flow rate	Flow rate of water	Gal/minute	Number		
B.6.44	Faucet aerator	Indicate if faucet has aerator		Boolean		
B.6.45	Temperature initiated shower flow restriction value			Boolean		
B.6.46	Third party certification	Independent organization has verified that product or appliance meets or exceeds the standard in question (ENERGY STAR, CEE, or other)		Enumeration	Energy star, Energy star most efficient, WaterSense, CEE tier 1, CEE tier 2, CEE tier 3, Other, Unknown	

ANNEX B.7 SOLAR THERMAL

	Data element	Definition	Units	Data type	Enumeration	Notes
B.7.1	Manufacturer			Text		
B.7.2	Model number			Text		
B.7.3	System type			Enumeration	Hot water, Hot water and space heating, Space heating, Hybrid system	
B.7.4	Collector area		Square feet	Number		
B.7.5	Collector loop type			Enumeration	Air direct, Air indirect, Liquid direct, Liquid indirect, Passive thermosyphon	
B.7.6	Collector type			Enumeration	Single glazing black, Single glazing selective, Double glazing black, Double glazing selective, Evacuated tube, Integrated collector storage	
B.7.7	Collector orientation			Enumeration	North, Northwest, West, Southwest, South, Southeast, East, Northeast	
B.7.8	Collector azimuth		Degrees	Number		
B.7.9	Collector tilt		Degrees	Number		
B.7.10	Storage volume		Gallons	Number		

ANNEX B.8 PHOTOVOLTAIC

	Data element	Definition	Units	Data type	Enumeration	Notes
B.8.1	Location			Enumeration	Roof, Ground, Other	
B.8.2	Ownership			Enumeration	Leased, Owned, Power purchase agreement, Utility owned, Other	
B.8.3	Year installed		Year	Number		
B.8.4	Array orientation			Enumeration	North, Northwest, West, Southwest, South, Southeast, East, Northeast	
B.8.5	Array azimuth		Degrees	Number		
B.8.6	Array tilt		Degrees	Number		
B.8.7	Maximum power output	Peak power as supplied by the manufacturer	DC Watts	Number		
B.8.8	Annual output	Projected Annual Output for a typical meteorological year as determined by PV Watts or similar.	kWh	Number		

ANNEX B.8 PHOTOVOLTAIC

B.8.9	Levelized cost of energy	The LCOE is the total cost of installing and operating a project expressed in dollars per kilowatt-hour of electricity generated by the system over its life. Can be calculated with System Advisor Model, similar software, or through a simplified calculation at http://www.nrel.gov/analysis/tech_lcoe.html.	Dollars	Number		
B.8.10	Collector area		Square feet	Number		
B.8.11	Inverter efficiency	Percentage of power that is converted to usable AC efficiency		Text		
B.8.12	Year inverter manufactured		Year	Number		
B.8.13	Year module manufactured		Year	Number		

ANNEX B.9 WIND

	Data element	Definition	Units	Data type	Enumeration	Notes
B.9.1	Wind turbine model			Text		
B.9.2	Year installed		Year	Number		
B.9.3	Third party certification	Independent organization has verified that product or appliance meets or exceeds the standard in question (ENERGY STAR, CEE, or other)		Enumeration	AWEA 9.1-2009, Other	
B.9.4	AWEA rated annual energy	The calculated total energy that would be produced during a one-year period with an average wind speed of 5 m/s (11.2 mph)	kW	Number		
B.9.5	AWEA rated sound Level	The sound pressure level not exceeded by the wind turbine 95% of the time at a distance of 60 meters from the rotor with an average wind speed of 5 m/s (11.2 mph).		Number		
B.9.6	AWEA rated power	The wind turbine's power output at 11m/s (24.6 mph). Manufacturers may still describe or name their turbine models using a nominal power (e.g., 5 kW S-343).	kWh	Number		

ANNEX B.9 WIND

B.9.7	Peak power	The highest point on the certified power curve.	kW	Number		
B.9.8	Rotor diameter		Feet	Number		
B.9.9	Hub height		Feet	Number		
B.9.10	Levelized cost of energy	The LCOE is the total cost of installing and operating a project expressed in dollars per kilowatt-hour of electricity generated by the system over its life. Can be calculated with System Advisor Model, similar software, or through a simplified calculation at http://www.nrel.gov/analysis/tech_lcoe.html.	Dollars	Number		

ANNEX B.10 APPLIANCES

B.10.1 APPLIANCE INFORMATION

	Data element	Definition	Units	Data type	Enumeration	Notes
B.10.1.1	Number of units			Number		May be repeated for all appliances
B.10.1.2	Manufacturer			Text		May be repeated for all appliances
B.10.1.3	Model number			Text		May be repeated for all appliances
B.10.1.4	AHRI number			Text		May be repeated for all appliances
B.10.1.5	Third party certification	Independent organization has verified that product or appliance meets or exceeds the standard in question (ENERGY STAR, CEE, or other)		Enumeration	ENERGY STAR, ENERGY STAR Most Efficient, CEE Tier 1, CEE Tier 2, CEE Tier 3	May be repeated for all appliances

B.10.2 CLOTHES WASHER

B.10.2.1	Type			Enumeration	Top loader, Front loader, All-in-one combination washer/dryer, Unitized/stacked washer-dryer pair	
B.10.2.2	Location			Enumeration	Laundry room, Living space, Basement, Other	

ANNEX B.10 APPLIANCES

B.10.2.3	Modified energy factor	Considers the amount of dryer energy used to remove the remaining moisture content in washed items, in addition to the machine energy and water heating energy of the washer. Modified energy factor (MEF) is the energy performance metric for ENERGY STAR qualified clothes washers. The higher the MEF, the more efficient the clothes washer.		Number		
B.10.2.4	Water factor	Number of gallons per cycle per cubic foot that the clothes washer uses		Number		
B.10.2.5	Usage		Loads/week	Number		

B.10.3 CLOTHES DRYER

B.10.3.1	Type			Enumeration	Dryer, All-in-one combination washer/dryer, Unitized/stacked washer-dryer pair	
B.10.3.2	Location			Enumeration	Laundry room, Living space, Basement, Other	

ANNEX B.10 APPLIANCES

B.10.3.3	Fuel			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	
B.10.3.4	Usage		Loads/week	Number		

B.10.4 DISHWASHER

B.10.4.1	Type			Enumeration	Uncategorized, Built-in under counter, Portable, Counter-top, Single tank, Conveyor	
B.10.4.2	Heat dry default off			Boolean		
B.10.4.3	Auxiliary water heater default off			Boolean		
B.10.4.4	Rated annual kWh		kWh	Number		
B.10.4.5	Energy factor			Number		
B.10.4.6	Rated water gallons per cycle		Gallons	Number		

ANNEX B.10 APPLIANCES

B.10.4.7	Fuel			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	
B.10.5 REFRIGERATOR						
B.10.5.1	Type			Enumeration	Side-by-side, Top freezer, Bottom freezer, Single door, Full-size one door, Full-size two doors, Half or quarter size, Walk-in, Open case, Closed case, Uncategorized	
B.10.5.2	Location			Enumeration	Kitchen, Living space, Basement, Garage, Other	
B.10.5.3	Rated annual kWh		kWh	Number		
B.10.5.4	Primary refrigerator	True if it is the primary refrigerator		Boolean		
B.10.5.5	Volume		Cubic feet	Number		
B.10.5.6	Fresh volume	Volume of refrigerator for keeping food at less than freezing	Cubic feet	Number		
B.10.5.7	Frozen volume	Freezer volume	Cubic feet	Number		
B.10.6 FREEZER						
B.10.6.1	Location			Enumeration	Kitchen, Living space, Basement, Garage, Other	

ANNEX B.10 APPLIANCES

B.10.6.2	Rated annual kWh		kWh	Number		
B.10.6.3	Configuration			Enumeration	Uncategorized, Manual defrost, Frost free, Walk-in, Case	
B.10.6.4	Volume		Cubic feet	Number		
B.10.7 DEHUMIDIFIER						
B.10.7.1	Location			Enumeration	Living space, Basement, Other	
B.10.7.2	Efficiency		Liters/kWh	Number		
B.10.8 COOKING RANGE						
B.10.8.1	Fuel type			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	

ANNEX B.10 APPLIANCES

B.10.9 OVEN

B.10.9.1	Fuel type			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	

ANNEX B.11 LIGHTING

	Data element	Definition	Units	Data type	Enumeration	Notes
B.11.1	Location			Enumeration	Interior, Exterior, Common Area	
B.11.2	Number of units			Number		
B.11.3	Lighting Type			Enumeration	Incandescent (Halogen); Fluorescent tube; Compact Fluorescent; Light emitting diode; High intensity discharge (Mercury vapor, Sodium, Sodium - high pressure, Sodium - low pressure, Metal halide, Other - describe); Other (describe)	
B.11.4	Tube type			Enumeration	T5, T8, Super T8, T12	

ANNEX B.11 LIGHTING

B.11.5	Average lumens	Lumens are a measure of light output (brightness) as opposed to watts, which measures energy consumption. The EPA and DOE encourage people to determine the amount of light (or brightness) they need first before purchasing a light bulb. Once brightness is determined, you can look for the bulb with the lowest watts.		Number		
B.11.6	Average wattage	Wattage per unit		Number		
B.11.7	Third party certification	Independent organization has verified that product or appliance meets or exceeds the standard in question (ENERGY STAR, CEE, or other)		Enumeration	ENERGY STAR, Other	
B.11.8	Average hours per day			Number		
B.11.9	Lighting daily hours			Enumeration	1 to 4 hours per day, 4 to 12 hours per day, More than 12 hours per day, All day	
B.11.10	Total floor area served		Square feet	Number		

ANNEX B.11 LIGHTING

B.11.11	Lighting control type	Bi-level controls are bi-level fixtures that operate at different levels of light output to meet the lighting need and are triggered by passive infrared (PIR) sensors, ultrasonic sensors, and photo-sensors		Enumeration	Daylight dimming, Occupancy sensors, Vacancy sensors, Manual dimming, Bi-level control, Timers, Manual, Advanced controls, Part of emcs	
B.11.12	Number of lighting controls installed			Number		
B.11.13	Location			Enumeration	Interior, Exterior, Common Area	
B.11.14	Incandescent	Fraction of lights that are incandescent		Fraction		
B.11.15	Compact fluorescent light (CFL)	Fraction of lights that are CFLs		Fraction		
B.11.16	Linear fluorescent light (LFL)	Fraction of lights that are linear fluorescent		Fraction		
B.11.17	Light-emitting diode (LED)	Fraction of lights that are LED		Fraction		
B.11.18	Lighting fixture third party certification			Enumeration	Energy star, Energy star most efficient, CEE tier 1, CEE tier 2, CEE tier 3, Other, Unknown	
B.11.19	Fan speed			Enumeration	Low, Medium, High	
B.11.20	Airflow		CFM	Number		

ANNEX B.11 LIGHTING

B.11.21	Efficiency	The efficiency rating of a ceiling fan as determined by the test procedure defined by the Environmental Protection Agency's ENERGY STAR Testing Facility Guidance Manual: Building a Testing Facility and Performing the Solid State Test Method for ENERGY STAR Qualified Ceiling Fans, Version 1.1, December 9, 2002. This is generally printed on the box in which the ceiling fan is shipped.	CFM/watt	Number		
B.11.22	Third party certification	Independent organization has verified that product or appliance meets or exceeds the standard in question (ENERGY STAR, CEE, or other)		Enumeration	ENERGY STAR, ENERGY STAR Most Efficient, CEE Tier 1, CEE Tier 2, CEE Tier 3	

ANNEX B.12 MISCELLANEOUS LOADS

	Data element	Definition	Units	Data type	Enumeration	Notes
B.12.1	Number of plug load controls			Number		
B.12.2	Plug load control type			Enumeration	Advanced power strip for AV, Advanced power strip for IT, Whole-house energy management system, Other	
B.12.3	Plug load type			Enumeration	TV plasma, TV CRT, TV other, Computer, Space heater, Water bed, Aquarium, Electric vehicle charging, Sauna, Well pump, Other	
B.12.4	Plug load location			Enumeration	Interior, Exterior	
B.12.5	Number of plug loads			Number		
B.12.6	Units			Enumeration	kWh/year, W	
B.12.7	Value			Number		

ANNEX B.13 POOLS

	Data element	Definition	Units	Data type	Enumeration	Notes
B.13.1	Type of pool			Enumeration	In ground, On ground, Above ground, Other, Unknown, None	
B.13.2	Volume	Volume of pool in gallons	Gallons	Number		
B.13.3	Months per year of operation		Months	Number		
B.13.4	Return pipe diameter		Inches	Number		
B.13.5	Suction pipe diameter		Inches	Number		
B.13.6	Filter type	Type of filter used, if any		Enumeration	Sand, DE, Cartridge, Other, Unknown, None	
B.13.7	Type	Pool pump is a mechanical assembly consisting of a “wet-end,” which houses the impeller and a motor. The pump increases the “head” and “flow” of the water (ENERGY STAR, 2013).		Enumeration	Single-speed, Multi-speed, Variable-speed, Variable-flow, Other, Unknown, None	
B.13.8	Model number	Model number of pool pump		Text		

ANNEX B.13 POOLS

B.13.9	Third party certification	Independent organization has verified that product or appliance meets or exceeds the standard in question (ENERGY STAR, CEE, or other)		Enumeration	ENERGY STAR, ENERGY STAR Most Efficient, CEE Tier 1, CEE Tier 2, CEE Tier 3, Other, Unknown, None	
B.13.10	Energy factor	The measure of overall pool filter pump efficiency in units of gallons per watt-hour, as determined using the applicable test method in Section 4.1.2 ANSI/APSP/ICC-15 2011. Energy factor is analogous to other energy factors such as miles per gallon. Energy factor (EF) is calculated as: EF (gal/Wh) = flow rate (gpm) * 60 ÷ power (watts) (ANSI/APSP/ICC-15 2011).	gal/Wh	Number		
B.13.11	Speed setting	The speed setting at which the Energy Factor was measured (ENERGY STAR, 2013)		Enumeration	Low, High, Most efficient, Other, Unknown, None	

ANNEX B.13 POOLS

B.13.12	Rated horse power	The motor power output designed by the manufacturer for a rated RPM, voltage and frequency. May be less than total horsepower where the service factor is > 1.0, or equal to total horsepower where the service factor = 1.0 (ANSI/APSP/ICC-15 2011).	Horse power	Number		
B.13.13	Total horse power	The total horsepower, or product of the rated horsepower and the service factor of a motor used on a pool pump (also known as SFHP) based on the maximum continuous duty motor power output rating allowable for the nameplate ambient rating and motor insulation class (e.g., total horsepower = rated horsepower * service factor) (ANSI/APSP/ICC-15 2011).	Horse power	Number		

ANNEX B.13 POOLS

B.13.14	Service factor	A multiplier applied to the rated horsepower of a pump motor to indicate the percent above nameplate horsepower at which the motor can operate continuously without exceeding its allowable insulation class temperature limit, provided that other design parameters, such rated voltage, frequency and ambient temperature, are within limits. A 1.5 hp pump with a 1.65 service factor produces 2.475 hp (total horsepower) at the maximum service factor point (ANSI/APSP/ICC-15 2011).		Number		
B.13.15	Hours per day pool pump operates	Number of hours per day a pool pump operates at a particular speed setting	Hours	Number		
B.13.16	Power		Watts	Number		
B.13.17	Motor nominal speed	The number of revolutions of the motor shaft in a given unit of time, expressed as revolutions per minute (RPM) (ENERGY STAR, 2013)	Revolutions/minute	Number		

ANNEX B.13 POOLS

B.13.18	Flow rate	The volume of water flowing through the filtration system in a given time, usually measured in gallons per minute (gpm) (ANSI/APSP/ICC-15 2011)	gal/minute	Number		
B.13.19	Cleaner type	Type of pool cleaner used, if any		Enumeration	Robotic, Suction side, Pressure side, Booster pump, Other, Unknown, None	
B.13.20	Hours per day cleaner is used		Hours/day	Number		
B.13.21	Heater type	Type of heater used to heat pool, if any		Enumeration	Gas-fired, Electric resistance, Heat pump, Solar, Other, Unknown, None	
B.13.22	Hours per day heater is used		Hours/day	Number		

ANNEX B.14 HEALTH AND SAFETY

B.14.1 GENERAL

	Data element	Definition	Units	Data type	Enumeration	Notes
B.14.1.1	Tests completed			Boolean		
B.14.1.2	Tests passed			Boolean		

B.14.2 VENTILATION

B.14.2.1	Requirement method			Enumeration	ASHRAE 62.2-1989, ASHRAE 62.2-2007, ASHRAE 62.2-2010, ASHRAE 62.2-2013	
B.14.2.2	Infiltration credit applied	ASHRAE 62.2-2010 has an infiltration credit. ASHRAE 62-89 and 62.2-2013 do not have infiltration credits.		Boolean	True, False, NA	
B.14.2.3	Local weather factor			Number		
B.14.2.4	N-Factor			Number		
B.14.2.5	Infiltration credit CFM-natural	The number of the calculated infiltration credit		Number		
B.14.2.6	Required ventilation rate	This is the net amount of continuous ventilation needed AFTER infiltration credit is applied (if any)		Number		
B.14.2.7	Required ventilation rate units			Enumeration	ACH, CFMnat	

ANNEX B.14 HEALTH AND SAFETY

B.14.2.8	Ventilation fan – Third party certification			Enumeration	ENERGY STAR, Home Ventilation Institute, Other	
B.14.2.9	Ventilation improvement recommendation			Enumeration	Require, Recommend, No recommendation	
B.14.2.10	Location			Enumeration	Kitchen, Bath, Garage, Other	
B.14.2.11	Intermittent exhaust rate	This is amount without taking into consideration any infiltration credit		Number		
B.14.2.12	Continuous exhaust rate	This is amount without taking into consideration any infiltration credit		Number		
B.14.2.13	Window opening credit	Should be 20 cfm, if the local AHJ permits windows to be used for local exhaust	CFM	Number		
B.14.2.14	Required intermittent exhaust rate	This is the net amount of continuous ventilation needed AFTER window credit is applied (if any)		Number		
B.14.2.15	Required continuous exhaust rate	This is the net amount of continuous ventilation needed AFTER window credit is applied (if any)		Number		
B.14.2.16	Initial airflow deficit	The airflow deficit for each bathroom or kitchen is the required airflow less the airflow rating of the exhaust equipment. If there is no exhaust device or if the existing device cannot be measured nor read, the exhaust device airflow is assumed to be zero.		Number		

ANNEX B.14 HEALTH AND SAFETY

B.14.2.17	Airflow rate units	Air changes per hour (ACH); cubic feet per minute (CFM).		Enumeration	CFM, ACH, L/s	
B.14.2.18	Does a proper air barrier separate the house from the garage?			Enumeration	Yes (installed); No (recommended); n/a	
B.14.2.19	Are the ducts and air handlers that are located in the garage properly air sealed?			Enumeration	Yes (installed); No (recommended); n/a	
B.14.2.20	Is the clothes dryer properly vented?			Enumeration	Yes (installed); No (recommended); n/a	
B.14.2.21	Other ventilation issues			Text		
B.14.2.22	Other ventilation issues			Enumeration	Yes (installed); No (recommended); n/a	
B.14.2.23	Garage ducts and air handlers air sealed			Boolean		
B.14.2.24	Mechanical ventilation system installed			Boolean		

B.14.3 MOISTURE CONTROL

B.14.3.1	Exterior locations of water intrusion damage			Enumeration	Roof, Interior ceiling, Foundation, Basement, Crawlspace, Walls, Around windows, Other	
B.14.3.2	Locations of interior water leaks or water damage			Enumeration	Kitchen, Bathroom, Basement, Other	
B.14.3.3	Vapor retarders installed			Boolean		
B.14.3.4	Gutters installed or repaired			Boolean		
B.14.3.5	Flashing installed or repaired			Boolean		
B.14.3.6	Foundation grading improved			Boolean		
B.14.3.7	Other measures implemented			Text		

ANNEX B.14 HEALTH AND SAFETY

B.14.4 COMBUSTION APPLIANCES

B.14.4.1	CAZ depressurization limit	Pulled from industry standards by users (e.g., BPI Gold Sheet) or via software program	Pa	Number		
B.14.4.2	Items running - Baseline test	Baseline pressure is read under the following conditions: no items running, all fans off, all exterior doors closed, and all interior doors are opened		Enumeration	Bath exhaust fan, Kitchen exhaust fan, Clothes dryer, Central vacuum, Air handler	
B.14.4.3	Doors opened - Baseline test			Enumeration	Basement doors, Other doors	
B.14.4.4	Doors closed - Baseline test			Enumeration	Basement doors, Other doors	
B.14.4.5	Baseline pressure		Pa	Number		
B.14.4.6	Items running - Poor case test	The poor case CAZ depressurization test is configured by determining the largest combustion appliance zone depressurization attainable at the time of testing due to the combined effects of door position; exhaust appliance operation, and air handler fan operation. A base pressure must be measured with all fans off and doors open. The poor case CAZ depressurization measurement is the pressure difference between the largest depressurization attained at the time of testing and the base pressure.			Bath exhaust fan, Kitchen exhaust fan, Clothes dryer, Central vacuum, Air handler	

ANNEX B.14 HEALTH AND SAFETY

B.14.4.7	Doors opened - Poor case test				Basement doors, Other doors	
B.14.4.8	Doors closed - Poor case test				Basement doors, Other doors	
B.14.4.9	Poor case pressure		Pa	Number		
B.14.4.10	Net pressure change		Pa	Number		
B.14.4.11	Depressurization finding poor case			Enumeration	Pass, Fail	
B.14.4.12	Amount ambient CO in CAZ during testing		ppm	Number		
B.14.4.13	Ambient CO in CAZ exceeded 35 ppm during testing			Boolean		
B.14.4.14	Flue visual condition			Enumeration	Pass, Fail	
B.14.4.15	Flue condition notes			Text		
B.14.4.16	Outside temperature at time of flue draft test		Degrees Fahrenheit	Number		
B.14.4.17	Poor scenario - Flue draft test		Pa	Number		
B.14.4.18	Current condition - Flue draft test	This element is formerly known as "spillage, draft, and CO readings under natural conditions" as explained in BPI's Gold Sheet "Combustion Safety Test Procedure for Vented Appliances."	Pa	Number		
B.14.4.19	Test result type - Flue draft test			Enumeration	Pass, Fail, Not tested	
B.14.4.20	Poor scenario - Spillage test		Seconds	Number		
B.14.4.21	Current condition - Spillage test		Seconds	Number		
B.14.4.22	Test result type - Spillage test			Enumeration	Pass, Fail, Not tested	
B.14.4.23	Poor scenario - Carbon monoxide test		ppm	Number		
B.14.4.24	Current condition - Carbon monoxide test		ppm	Number		

ANNEX B.14 HEALTH AND SAFETY

B.14.4.25	Test result type - Carbon monoxide test			Enumeration	Pass, Fail, Not tested	
B.14.4.26	Max ambient CO in living space during audit	Monitored throughout assessment, not just appliance testing	ppm	Number		
B.14.4.27	Ambient CO action during CAZ testing	BPI Gold Sheet is one example that shows action levels based upon decision logic	ppm	Number		
B.14.4.28	Stack temperature		Degrees Fahrenheit	Number		
B.14.4.29	Fuel			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	
B.14.4.30	Fuel leaks identified			Boolean		
B.14.4.31	Leaks addressed			Boolean		
B.14.4.32	Notes			Text		

ANNEX B.14 HEALTH AND SAFETY

B.14.5 STOVE TEST

B.14.5.1	Stove fuel			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	
B.14.5.2	Heating stove properly vented			Boolean		
B.14.5.3	CO reading			Number		
B.14.5.4	Gas leaks identified			Boolean		
B.14.5.5	Actions taken			Text		

B.14.6 LEAD PAINT

B.14.6.1	Did the contracted scope of work disturb greater than 6 square feet of interior painted surfaces?			Boolean		Applies to homes built before 1978
B.14.6.2	Did the contracted scope of work disturb greater than 20 square feet of exterior painted surfaces?			Boolean		Applies to homes built before 1978
B.14.6.3	Did the contracted scope of work include window replacement?			Boolean		
B.14.6.4	EPA Lead-Safe Certification Number of firm that performed work			Text		

ANNEX B.14 HEALTH AND SAFETY

B.14.7 RADON

B.14.7.1	Radon tested			Boolean		
B.14.7.2	Radon test	Start date time		DateTime		
B.14.7.3	Radon test	End date time		DateTime		
B.14.7.4	Radon test	Radon test location		Enumeration	Kitchen, Crawlspace, Basement, Bedroom, Living room, Other	
B.14.7.5	Radon test	Radon test results	pCi/L	Number		
B.14.7.6	Radon test	Radon test method		Enumeration	Activated charcoal absorption, Alpha-track detectors, Unfiltered track detection, Short term electret ion chamber, Long term electret ion chamber, Continuous radon monitoring	
B.14.7.7	Educational materials provided to homeowner?			Boolean		
B.14.7.8	Actions taken			Text		

ANNEX B.14 HEALTH AND SAFETY

B.14.7.9	Actions meet industry specifications?	If moisture management of a crawlspace (e.g., installation of polyethylene sheeting) or radon mitigation measures were a part of the scope of work, were measures installed to be compliant with one of the following: -Specifications of EPA's Indoor airPlusprogram -Techniques detailed in EPA's Radon-Resistant New Construction -ASTM E2121, Standard Practice for Installing Radon Mitigation Systems in Residential Buildings (section 7.3)		Boolean		
B.14.7.13	Result less than 4 pCi/L			Boolean		

B.14.8 SOURCE POLLUTANTS

B.14.8.1	Are there unvented combustion heating or hearth appliances present in the living area?			Boolean		
B.14.8.2	If yes, does the appliance conform to ANSI Z21.11.2?			Boolean		
B.14.8.3	If yes, is the appliance used as a primary source of heating?			Boolean		
B.14.8.4	Does home have attached garage?			Boolean		
B.14.8.5	If yes, is there a continuous air barrier between garage and living space?			Boolean		

ANNEX B.14 HEALTH AND SAFETY

B.14.8.6	If yes, is there an exhaust fan in garage?			Boolean		
			B.14.9 PESTS			
B.19.9.1	Indications of pest entry or damage?			Boolean		
B.19.9.2	Evidence of pesticide or insecticide use?			Boolean		
			B.14.10 ASBESTOS			
B.14.10.1	Was asbestos suspected?			Boolean		
B.14.10.2	Was substance tested for asbestos?			Boolean		
B.14.10.3	Was asbestos found?			Boolean		
B.14.10.4	Type of blower door test			Enumeration	Pressurization, Depressurization	
B.14.10.5	Actions taken			Text		
B.14.10.6	Actions meet industry specifications?			Boolean		
			B.14.11 SPRAY FOAM			
B14.11.1	Were spray foam, polyurethane foam and/or other potential sources of indoor pollutants installed or applied as part of the scope of work?			Boolean		

ANNEX B.15 MODELED USAGE

	Data element	Definition	Units	Data type	Enumeration	Notes
B.15.1	Fuel			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	
B.15.2	Unit of measure			Enumeration	cmh (cubic meters per hour), ccf (hundred cubic feet), kcf (thousand cubic feet), MCF (million cubic feet), cfh (cubic feet per hour), kWh (thousand Watt hours), MWh (million Watt-hours), Btu, kBtu (thousand Btu), MBtu (million Btu), therms, Lbs. (pounds), KLbs. (thousand pounds), MLbs. (million pounds), Tonnes, Cords (Full Cord), Gal, KGal (thousand gallons), ton hour	

ANNEX B.15 MODELED USAGE

B.15.3	Annual consumption	Energy (kWh) consumed per year		Number		
B.15.4	Annual fuel cost			Number		
B.15.5	End use type			Enumeration	Heating, Cooling, Hot water, Appliance, Lighting, PV, Solar thermal, Other	
B.15.6	End use value	Energy use will be negative for energy producing end uses such as PV and Solar Thermal		Number		
B.15.7	Baseload	Baseload power is the energy consumed for the day-to-day operation of a home that is not used as a response to outside weather (i.e., excludes heating and cooling) (Krigger and Dorsi, 2009).		Number		

ANNEX B.16 PROJECT/MEASURE INFORMATION

B.16 .1 PROJECT INFORMATION

	Data element	Definition	Units	Data type	Enumeration	Notes
B.16.1.1	Program name			Text		
B.16.1.2	Program sponsor			Text		
B.16.1.3	Certifying organization			Enumeration	US Green Building Council (LEED Rating System), Home Innovation Research Labs, Local program, ENERGY STAR Certified New Home, Passive House Institute US (PHUIS)	
B.16.1.4	Certifying organization URL			Text		
B.16.1.5	Year certified		Year	Number		
B.16.1.6	Program certificate			Enumeration	Home Performance with ENERGY STAR, Certified, Silver, Bronze, Gold, Platinum, Emerald, 1-Star, 2-Star, 3-Star, 4-Star, 5-Star, Net-zero, PHIUS+	
B.16.1.7	ENERGY STAR Certified New Home Version			Text		
B.16.1.8	Project type			Text		

ANNEX B.16 PROJECT/MEASURE INFORMATION

B.16.1.9	Title			Text		
B.16.1.10	Event type	Quality assurance: The observation techniques and activities used externally by an organization to evaluate the effectiveness of their quality management system and to provide feedback that may result in quality improvements (BPI, 2006).		Enumeration	Audit, Proposed work scope, Approved work scope, Construction period testing/daily test out, Job completion testing/final inspection, Quality assurance/monitoring, Supervised audit	
B.16.1.11	Date			Date		
B.16.1.12	Notes			Text		
B.16.1.13	Project start date	Start date of the project		Date		
B.16.1.14	Estimated project completion date	Estimated completion date		Date		
B.16.1.15	Actual project completion date	Actual project completion date		Date		
B.16.1.16	Hours	Amount of time contractor spent on this stage of project.		Number		
B.16.1.17	Fees associated with audit or other project activities		Dollars	Number		
B.16.1.18	Cost of health and safety measures	Cost of all work performed or proposed	Dollars	Number		
B.16.1.19	Cost of qualifying energy measures	Cost of all work performed or proposed	Dollars	Number		
B.16.1.20	Incentive type			System identifier		Element can be repeated for project and by measure
B.16.1.21	Funding source code			Text		Element can be repeated for project and by measure

ANNEX B.16 PROJECT/MEASURE INFORMATION

B.16.1.22	Funding source name			Text		Element can be repeated for project and by measure
B.16.1.23	Incentive amount		Dollars	Number		

B.16.2 MEAURE INFORMATION

B.16.2.1	Measure code			Text		
B.16.2.2	Measure description			Text		
B.16.2.3	Units	The number of measures installed or repaired as part of the program		Text		
B.16.2.4	Value			Value		
B.16.2.5	Unit location			Enumeration	Attic - conditioned, Attic - unconditioned, Basement - conditioned, Basement - unconditioned, Conditioned space, Crawlspace - vented, Crawlspace - unvented, Garage - conditioned, Garage - unconditioned, Mechanical closet, Other interior, Other exterior, Roof deck	
B.16.2.6	Estimated life			Number		
B.16.2.7	Installation date			Date		
B.16.2.8	Cost		Dollars	Number		
B.16.2.9	Unit pricing indicator			Boolean		
B.16.2.10	Resource type code			Number		

ANNEX B.16 PROJECT/MEASURE INFORMATION

B.16.2.11	Load profile	A load profile is created using measurements of a customer's electricity use at regular intervals, typically one hour or less, and provides an accurate representation of a customer's usage pattern over time		Number		
B.16.2.12	Quantity			Number		
B.16.2.13	Annual amount		Dollars	Number		
B.16.2.14	Customer notes			Text		
B.16.2.15	Work scope notes			Text		
B.16.2.16	Work status			Enumeration	Installed, Not installed, Recommended	
B.16.2.17	Reason for not installing measure			Text		
B.16.2.18	Quality assurance test result	The observation techniques and activities used externally by an organization to evaluate the effectiveness of their quality management system and to provide feedback that may result in quality improvements (BPI, 2006)		Enumeration	Passed, Failed, Not tested	
B.16.2.19	Quality assurance notes			Text		
B.16.2.20	Replaced component system identifier			System identifier		
B.16.2.21	Installed component system identifier			System identifier		

ANNEX B.17 RESOURCE SAVINGS

B.17.1 ENERGY SAVINGS

	Data element	Definition	Units	Data type	Enumeration	Notes
B.17.1.1	Energy savings type			Enumeration	Estimated, Measured	Element can be repeated for project and by measure
B.17.1.2	Energy savings reported			Enumeration	Gross, Net	Element can be repeated for project and by measure
B.17.1.3	Fuel			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	Element can be repeated for project and by measure
B.17.1.4	Total savings			Number		Element can be repeated for project and by measure
B.17.1.5	Total dollar savings		Dollars	Number		Element can be repeated for project and by measure
B.17.1.6	Percent reduction			Fraction		Element can be repeated for project and by measure

ANNEX B.17 RESOURCE SAVINGS

B.17.1.7	Units			Enumeration	cmh (cubic meters per hour), ccf (hundred cubic feet), kcf (thousand cubic feet), MCF (million cubic feet), cfh (cubic feet per hour), kWh (thousand Watt hours), MWh (million Watt-hours), Btu, kBtu (thousand Btu), MBtu (million Btu), therms, Lbs. (pounds), KLbs. (thousand pounds), MLbs. (million pounds), Tonnes, Cords (Full Cord), Gal, KGal (thousand gallons), ton hour	Element can be repeated for project and by measure
B.17.1.8	End use			Enumeration	Heating, Cooling, Hot water, Appliance, Lighting, PV, Solar thermal, Other	Element can be repeated for project and by measure
B.17.1.9	End use value			Number		Element can be repeated for project and by measure
B.17.1.10	Demand savings		kW or MW	Number		Element can be repeated for project and by measure
B.17.1.11	Annual percent reduction			Fraction		Element can be repeated for project and by measure
			B.17.2 WATER SAVINGS			
B.17.2.1	Water savings type			Enumeration	Estimated, Measured	Element can be repeated for project and by measure

ANNEX B.17 RESOURCE SAVINGS

B.17.2.2	Units			Enumeration	Gallon, KGal (thousand Gallons), MGal (million Gallons), cf (cubic feet), ccf (hundred cubic feet), kcf (thousand cubic feet), MCF (million cubic feet)	Element can be repeated for project and by measure
B.17.2.3	Total savings			Number		Element can be repeated for project and by measure
B.17.2.4	Total dollar savings		Dollars	Number		Element can be repeated for project and by measure
B.17.2.5	Percent reduction			Fraction		Element can be repeated for project and by measure
B.17.2.6	Rain barrels			Number		Element can be repeated for project and by measure
B.17.2.7	Reclaimed water system			Boolean		Element can be repeated for project and by measure

ANNEX B.18 CONSUMPTION INFORMATION

B.18.1 ENERGY CONSUMPTION

	Data element	Definition	Units	Data type	Enumeration	Notes
B.18.1.1	Fuel			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	

ANNEX B.18 CONSUMPTION INFORMATION

B.18.1.2	Unit of measurement			Enumeration	cmh (cubic meters per hour), ccf (hundred cubic feet), kcf (thousand cubic feet), MCF (million cubic feet), cfh (cubic feet per hour), kWh (thousand Watt hours), MWh (million Watt-hours), Btu, kBtu (thousand Btu), MBtu (million Btu), therms, Lbs. (pounds), KLbs. (thousand pounds), MLbs. (million pounds), Tonnes, Cords (Full Cord), Gal, KGal (thousand gallons), ton hour	
B.18.1.3	Metering configuration	Direct metering = tenants directly metered; Master meter without sub-metering = tenants not sub-metered Master meter with sub-metering = tenant sub-metered by building owner			Enumeration	Direct metering, Master meter without sub-metering, Master meter with sub-metering
B.18.1.4	Emissions type			Enumeration	Carbon dioxide (CO2), Methane (CH4), Nitrous Oxide (N2O), CO2 equivalent	
B.18.1.5	Emissions units			Enumeration	Kilograms (kg), Ton, Metric ton, Pound	

ANNEX B.18 CONSUMPTION INFORMATION

B.18.1.6	Emissions			Number		
B.18.1.7	Fuel interruptibility	Energy flow that can be reduced or completely stopped with little or no notice. Interruptible rate is the agreed-upon rate for energy sold as interruptible		Enumeration	Interruptible, Firm, n/a	
B.18.1.8	Shared energy system			Enumeration	Yes, No, Common meter	
B.18.1.9	Interval type	Indicates whether the reading is meant to be representative the data interval that's available. Data that's available can range from 15 minute interval to annual		Enumeration	15-minute, Hourly, Daily, Monthly, Annual	
B.18.1.10	Reading time zone			Text		
B.18.1.11	Marginal energy cost rate	The cost of providing an additional unit of output	$/energy unit	Number		

ANNEX B.18 CONSUMPTION INFORMATION

B.18.1.12	Energy use intensity	Energy use intensity (EUI) is a unit of measurement that describes a building's energy use. EUI represents the energy consumed by a building relative to its size	kBtu/ft^2	Number		
B.18.1.13	Peak season	Period during which electrical power is expected to be provided at a significantly higher than average supply level		Enumeration	Summer, Winter	
B.18.1.14	Consumption	The annual amount of all the energy the premises consumes on-site, as reported on the utility bills. A negative number should be used for renewable generation. Positive number indicates consumption.		Number		
B.18.1.15	Start date time	Date/time stamp in the ISO 8601 format when the usage measured began		DateTime		
B.18.1.16	End date time	Date/time stamp of the meter reading		DateTime		
B.18.1.17	Meter reading type			Enumeration	Point, Median, Average, Total, Estimate, Other	

ANNEX B.18 CONSUMPTION INFORMATION

B.18.1.18	Consumption cost	The annual cost associated with the selected 12 month time period for a premise. It can be an individual value for different energy types, and can also be an aggregated value across all energy types.	Dollars	Number		
B.18.1.19	Marginal rate			Number		
B.18.1.20	Baseload			Number		

B.18.2 WATER CONSUMPTION

B.18.2.1	Water type			Enumeration	Indoor and outdoor water, Indoor water, Outdoor water, Wastewater/sewer	
B.18.2.2	Unit of measurement			Enumeration	Gallon, kGal (thousand Gallons), MGal (million Gallons), cf (cubic feet), ccf (hundred cubic feet), kcf (thousand cubic feet), MCF (million cubic feet)	
B.18.2.3	Marginal water cost rate	The cost of providing an additional unit of output		Number		

ANNEX B.18 CONSUMPTION INFORMATION

B.18.2.4	Water use intensity units	Water use intensity is defined as annual water use divided by total gross square footage of facility space reported in gallons per square foot (DOE, 2013). This element may also be reported as gallons, per day, per person.		Enumeration	gal/sq.ft., gal/day/person	
B.18.2.5	Water use intensity value	Water use intensity is defined as annual water use divided by total gross square footage of facility space reported in gallons per square foot (DOE, 2013). This element may also be reported as gallons, per day, per person.		Number		
B.18.2.6	Consumption	The annual amount of all the energy the premises consumes on-site, as reported on the utility bills. A negative number should be used for renewable generation. Positive number indicates consumption.		Number		
B.18.2.7	Start date time	Date/time stamp in the ISO 8601 format when the usage measured began		DateTime		
B.18.2.8	End date time	Date/time stamp of the meter reading		DateTime		
B.18.2.9	Meter reading type			Enumeration	Point, Median, Average, Total, Estimate, Other	

ANNEX B.18 CONSUMPTION INFORMATION

B.18.2.10	Consumption cost	The annual cost associated with the selected 12 month time period for a premise. It can be an individual value for different energy types, and can also be an aggregated value across all energy types.	Dollars	Number		
B.18.2.11	Marginal rate			Number		
B.18.2.12	Baseload			Number		
B.18.3 ANSI/BPI-2400 INPUTS						
B.18.3.1	Weather regression start date			Date		
B.18.3.2	Weather regression end date			Date		
B.18.3.3	Calibration qualification			Enumeration	None, Detailed, Simple	
B.18.3.4	Calibration weather regression CV-RMSE	Detailed Calibration Baseload Weather Regression CV-RMSE. Eqn. 3.2.2.G.i of BPI-2400. Percentage expressed as a fraction (i.e., 10% = 0.1).		Fraction		
B.18.3.5	Weather normalized annual heating usage			Number		
B.18.3.6	Weather normalized annual cooling usage			Number		
B.18.3.7	Weather normalized annual baseload usage			Number		
B.18.3.8	Detailed model calibration heating bias error	Eqn. 3.2.3.A.i of BPI-2400		Fraction		

ANNEX B.18 CONSUMPTION INFORMATION

B.18.3.9	Detailed model calibration heating absolute error	Eqn. 3.2.3.A.ii of BPI-2400		Fraction		
B.18.3.10	Detailed model calibration cooling bias error			Fraction		
B.18.3.11	Detailed model calibration cooling absolute error			Fraction		
B.18.3.12	Detailed model calibration baseload bias error			Fraction		
B.18.3.13	Detailed model calibration baseload absolute error	Eqn. 3.2.3.A.i of BPI-2400		Fraction		
B.18.3.14	Simplified model calibration heating bias error	Used to determine model calibration acceptance when bills fail detailed criteria, but meet simple criteria. Percentage expressed as a fraction (i.e. 10% = 0.1).		Fraction		
B.18.3.15	Simplified model calibration cooling bias error	Used to determine model calibration acceptance when bills fail detailed criteria, but meet simple criteria. Percentage expressed as a fraction (i.e. 10% = 0.1).		Fraction		
B.18.3.16	Simplified model calibration total bias error	Used to determine model calibration acceptance when bills fail detailed criteria, but meet simple criteria. Percentage expressed as a fraction (i.e. 10% = 0.1).		Fraction		

ANNEX B.19 UTILITY OR FUEL/RESOURCE PROVIDER INFORMATION

	Data element	Definition	Units	Data type	Enumeration	Notes
B.19.1.	Utility name	Name of utility company billing this energy use		Text		
B.19.2	Meter number	Unique identification number for the meter		Number		
B.19.3	Utility account number	Unique number designated by the utility		Number		
B.19.4	Permission			Boolean		
B.19.5	Fuel			Enumeration	Electricity, Renewable electricity, Natural gas, Renewable natural gas, Fuel oil (1, 2, 4, 5/6), District steam, District hot water, District chilled water, Solar hot water, Propane, Kerosene, Diesel, Anthracite coal, Bituminous coal, Coke, Wood, Wood pellets, Combination, Other	

ANNEX B.20 SOFTWARE USED

	Data element	Definition	Units	Data type	Enumeration	Notes
B.20.1	Software program used			Text		
B.20.2	Software version			Text		