

Field Study Data Quality Assurance for Project Teams

Field study project teams are required to perform quality assurance (QA) on the data they collect prior to sending it to PNNL for additional QA and analysis. This document provides a list of QA checks that project teams should perform. While going through the following checklist, verify that all fields in the data collection form are marked as Meets Requirement/Does Not Meet Requirement, Not Applicable, or Not Observable or contain a value under Observation. There should be no blank fields. **If values are outside of the anticipated range, flag the value and verify its accuracy with the data collector and/or photo-documentation. Make a correction or add a note in Column O of the data collection form to substantiate the validity of the value.** The anticipated ranges in the right-most column are a starting point; project teams should decide what ranges they anticipate in their project territory.

	Description	ID	QA Performed	Anticipated Range
Home Tab				
<input type="checkbox"/>	Unique ID and Personally Identifiable Information	NA	The spreadsheet contains the home's unique ID and does not contain builder name, site address, or place/local jurisdiction/town. (County is required.)	NA
<input type="checkbox"/>	Climate Zone	LOC2 LOC4	Is the climate zone (LOC2) within the range of zones found within the study territory? Verify the county (LOC4) is in the climate zone entered in LOC 2.	See IECC Figure R301.1 or Table R301.1
<input type="checkbox"/>	Energy Code Used	Comp1	Is the energy code version within the anticipated date range for new construction in the study territory?	To be determined by study design
<input type="checkbox"/>	Additional Efficiency	Comp9 Comp10 Comp11	If the home has an Additional Efficiency Package Option selected, verify that the compliance field is marked with a yes or no, and that a compliance value is entered.	N/A

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<input type="checkbox"/>	Conditioned Floor Area	Geo1	Is the conditioned floor area within the anticipated range?	900 to 9,000 sf
<input type="checkbox"/>	Number of Stories	Geo2	Is the number of stories above grade within the anticipated range?	1 to 4
<input type="checkbox"/>	Number of Bedrooms	Geo3	Is the number of bedrooms within the anticipated range?	1 to 6
Envelope Tab				
<input type="checkbox"/>	ACH50 Measured	FI17	Is the air leakage rate within the anticipated range?	1.0 to 9.9
<input type="checkbox"/>	Ceiling Insulation at Eaves	CEX1	Raised heel trusses provide room for greater insulation R-values at the eaves, but space is not unlimited. If the field observation is "yes", is the ceiling insulation within the anticipated range given the insulation material?	R-19 to R-72 Should not be greater than the rest of the ceiling.
<input type="checkbox"/>	Ceiling Insulation R-value	FI1	Note the location of ceiling insulation (on the ceiling or between the rafters). Is the ceiling insulation R-value within the anticipated range given the insulation location, rafter depth (if applicable), and insulation material?	R-19 to R-72
<input type="checkbox"/>	Ceiling Insulation Grade	IQ1a IQ1b	Verify that an insulation installation grade has been entered. Consider verifying the input against photo-documentation, at least for the first few from each individual data collector.	Value present (I, II, III)
<input type="checkbox"/>	Knee Wall Insulation R-value – Cavity	KW1	Is the cavity insulation R-value within the anticipated range given the framing depth and insulation material?	R-11 to R-15 for 2x4 R-19 to R-23 for 2x6 May be higher if ccSPF is installed
<input type="checkbox"/>	Knee Wall Insulation R-value – Continuous	KW2	Is the insulation R-value within the anticipated range?	R-2.5 to R-15

	Description	ID	QA Performed	Anticipated Range
<input type="checkbox"/>	Window U-factor	FR2	Is the window U-factor within the anticipated range?	0.18 to 0.50
<input type="checkbox"/>	Window SHGC	FR3	Is the window SHGC within the anticipated range?	0.20 to 0.50
<input type="checkbox"/>	Foundation Type	BG17	Has the predominant foundation type been entered?	NA
<input type="checkbox"/>	Foundation Insulation	Various	Verify that the insulation R-value is entered in a row that matches the selected Predominant Foundation Type.	N/A
<input type="checkbox"/>	Unvented Crawl Space Insulation R-value – Cavity	FO7a	Is the cavity insulation R-value within the anticipated range given the framing depth (if applicable) and insulation material?	R-11 to R-15 for 2x4 R-19 to R-23 for 2x6 May be higher if ccSPF is installed
<input type="checkbox"/>	Unvented Crawl Space Insulation R-value – Continuous	FO7b	If continuous insulation is present, is the continuous insulation R-value within the anticipated range?	R-2.5 to R-15
<input type="checkbox"/>	Unvented Crawl Space Insulation Grade	CSIQ1a CSIQ1b	Verify that an insulation installation grade has been entered for cavity and/or continuous insulation as applicable.	Value present (I, II, III)
<input type="checkbox"/>	Floor Insulation R-value – Cavity	IN1a	Is the cavity insulation R-value within the anticipated range given the framing depth and insulation material?	R-19 to R-30 May be higher if ccSPF is installed
<input type="checkbox"/>	Floor Insulation R-value – Continuous	IN1b	If continuous insulation is present, is the continuous insulation R-value within the anticipated range?	Any
<input type="checkbox"/>	Floor Insulation Grade - Cavity	IQ2a	Is an insulation grade (I, II, III) entered for cavity and/or continuous insulation as applicable?	Value present (I, II, III)
<input type="checkbox"/>	Slab Insulation R-value	FO1	Is the insulation R-value within the anticipated range?	R-2.5 to R-15

	Description	ID	QA Performed	Anticipated Range
<input type="checkbox"/>	Frame Wall Insulation R-value – Cavity	IN3a	Is the cavity insulation R-value within the anticipated range given the framing depth?	R-11 to R-15 for 2x4 R-19 to R-23 for 2x6 May be higher if ccSPF is installed
<input type="checkbox"/>	Frame Wall Insulation R-value – Continuous	IN3b	If continuous insulation is present, is the insulation R-value within the anticipated range?	R-2.5 to R-15
<input type="checkbox"/>	Frame Wall Insulation Grade	IQ3a IQ3b	Is an insulation grade (I, II, III) entered for cavity and/or continuous insulation as applicable?	Value present (I, II, III)
<input type="checkbox"/>	Mass Wall Insulation R-value – Cavity	FR10a	Is the cavity insulation R-value within the anticipated range?	R-11 to R-15 for 2x4 R-19 to R-23 for 2x6
<input type="checkbox"/>	Mass Wall Insulation R-value - Continuous	FR10b	If continuous insulation is present, is R-value within the anticipated range?	R-2.5 to R-15
Mechanical Tab				
<input type="checkbox"/>	Duct Tightness Test Result	FI4a FI4b FI4c	For each duct system, is the CFM25/100 sf within the anticipated range?	1 to 20
<input type="checkbox"/>	Floor Area Served	DFAa DFAb DFAc	For each duct system, verify the approximate floor area served has been input, and that it is not greater than the floor area of the home. For multiple duct systems, the values should add up to the total floor area of the home.	≤ Total floor area of the home
<input type="checkbox"/>	Percent of Duct System in Conditioned Space	DP5a DP5b DP5c	Important: This field must be completed anytime a duct tightness measurement is entered. Verify the percent of duct system entry is in the proper units (%).	0 to 100
<input type="checkbox"/>	Duct Insulation R-values	FR12a FR12b FR12c FR12d	Are the duct insulation R-values within the anticipated range?	R-0 to R-12

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<input type="checkbox"/>	Heating source and system type	EQ1 EQ2a	Verify that the heating source makes sense for the equipment type entered.	Heat pump = electricity Furnace = gas or oil Boiler = gas or oil
<input type="checkbox"/>	Heating system type and efficiency	EQ2a EQ3a	Verify that the heating system efficiency value makes sense for the heating system type and is within the anticipated range.	HSPF: 6.8 to 13.5 HSPF2: 7.5 to 13.5 GSHP COP: 3 to 5 AFUE: Gas furnace: 80 to 99 Gas boiler: 80 to 97 Oil furnace: 80 to 97 Oil boiler: 80 to 91
<input type="checkbox"/>	Heating system capacity	EQ4a EQ4b EQ4c	Verify that the heating system capacity has been entered in the proper units (Btu/h) and is within the anticipated range.	Furnaces and boilers: 12,000 to 120,000 Btu/h ASHP (mini-split): 8,700 to 64,000 ASHP (ducted): 12,000 to 58,000
<input type="checkbox"/>	Cooling System Efficiency	EQ6a EQ6b EQ6c	Is the cooling system efficiency within the anticipated range?	SEER2: CAC: 13.4 to 26 ASHP: 14.3 to 34 GSHP EER: 16 to 49
<input type="checkbox"/>	Cooling System Capacity	EQ7a EQ7b EQ7c	Verify that the cooling system capacity has been entered in the proper units (Btu/h).	CAC: 12,000 to 60,000 Btu/h ASHP (min-split): 9,000 to 48,000 ASHP (ducted): 9,000 to 58,000

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<input type="checkbox"/>	Water Heating Fuel and System Type	WQ8 EQ9	Verify that the water heating fuel source aligns with the system type.	N/A
<input type="checkbox"/>	Water Heater Efficiency	EQ10	Is the water heater UEF within the anticipated range?	Storage: Elec resistance: 0.86 to 0.95 Gas: 0.54 to 0.93 Heat pump: 2.8 to 4.1 Instantaneous/Tankless: Elec resistance: 0.82 to 0.98 Gas: 0.81 to 0.96
<input type="checkbox"/>	Water Heater Storage	EQ11	Is the storage capacity within the anticipated range?	30 to 100 gallons
<input type="checkbox"/>	Mechanical Piping	FR17	Is the pipe insulation R-value within the anticipated range?	R-0 to R-6
<input type="checkbox"/>	SWH Pipe Insulation	FR18	Is the pipe insulation R-value within the anticipated range?	R-0 to R-6
<input type="checkbox"/>	Mechanical Ventilation	V1-V5h	If a whole-house mechanical system is observed (V1), then items V2 through V5h must contain applicable values.	N/A
<input type="checkbox"/>	Measured CFM of Mechanical Ventilation	V4b	Is the measured CFM value within the anticipated range? If there is no whole-house ventilation system, this should be NA.	30 to 210
<input type="checkbox"/>	Fan Efficacy	V5a-d	Is the fan efficacy within the anticipated range?	1 to 5
<input type="checkbox"/>	HRV/ERV SRE	V5e	Where an HRV or ERV is observed, is the Sensible Recovery Efficiency (SRE) within the anticipated range?	50 to 95
<input type="checkbox"/>	ERV Latent Recovery	V5h	Where an ERV is observed, is the Latent Recovery/Moisture Transfer (LRMT) within the anticipated range?	0.1 to 0.9

	Description	ID	QA Performed	Anticipated Range
Lighting & Electrical Tab				
<input type="checkbox"/>	Percent high-efficacy lighting	F16	Is the percentage of high-efficacy lighting between 0 and 100?	0 to 100
<input type="checkbox"/>	Electrical Panel	EP1	Is the electrical panel size entry within the anticipated range?	60 to 400 Typically, one of the following: 60, 100, 125, 150, 200, 220, 300, or 400