Appendix E – Phius Certified Rater & Verifier Manual: Version 1.2

This section outlines the prerequisites and process of becoming a Phius Certified Rater or Phius Certified Verifier, eligibility to inspect and verify Phius projects, and the responsibilities of the Rater/Verifier in the certification of Phius projects.

E-1.0 Definition & Eligibility

Phius Certified Raters and Phius Certified Verifiers are certified professionals eligible to perform the on-site inspections and performance testing requirements for verification of all aspects of Phius Certification. The eligibility of each professional to inspect and verify a given project type depends on the designation.

E-1.1 Phius Certified Rater

Eligible to inspect and verify single-family homes, duplexes and Townhomes (as defined under Energy Star Certified Homes Program) for Phius certification.

E-1.2 Phius Certified Verifier

All Phius Certified Verifiers are eligible to inspect and verify non-residential projects for Phius certification.

E-1.2.1 Multifamily Designation

Phius Certified Verifiers with the multifamily designation are also eligible to inspect and verify multifamily projects (including Townhomes) for Phius certification. See more on Exam Eligibility.

E-1.3 Third Party Status

Phius Certified Rater and Phius Certified Verifiers cannot serve as the CPHC or builder on a project in which they are performing verification. However, another member of the Rater/Verifier's company may perform this scope with prior written approval from Phius certification staff.

E-2.0 Certification Requirements and Maintenance

E-2.1 Phius Certified Rater Information

The Phius Certified Rater training course is geared toward single-family building professionals. The course will be open to any potential candidates. Certification and earning the professional title of Phius Certified Rater will be contingent upon applying for and passing the Phius Certified Rater Exam.

E-2.1.1 Phius Certified Rater Exam Eligibility

To be eligible to take the Phius Certified Rater Exam the following documentation must be provided when applying for the exam:

In the United States:

1. Provide proof of all the following:
    a. Current EPA Energy Star Rater Partnership Agreement
    b. Current EPA Indoor airPLUS Partnership Agreement
    c. Current Dept. of Energy (DOE) Zero Energy Ready Homes Rater Partnership
    d. Successful completion of EPA Energy Star Certified Homes v3.0 Training
    e. Successful completion of Phius Certified Rater Training, OR already Certified as a Phius Certified Verifier
    f. Alignment with recognized programs per below:
        1. All states except California and Alaska:
            - Fully Certified as a RESNET HERS Rater
            - Currently aligned with a RESNET QA Provider and in good standing with RESNET
        2. In California
            - Be certified as a HERS Rater and be in good standing with either a RESNET QA Provider or a California Energy Commission Approved-Provider
        3. In Alaska
            - Be certified as a HERS Rater and be in good standing with either a RESNET QA Provider or a certified Energy Rater through the Alaska Housing Finance Corporation.

In Canada:

1. Be a certified rater in good standing with either CRESNET or Natural Resources Canada.
2. Attest to knowledge and understanding of the EPA ENERGY STAR Certified Homes, EPA Indoor airPLUS Certified Homes, and a DOE Zero Energy Ready Homes programs.

In other international locations:

1. Credentials will be verified on a case-by-case basis. Candidates should have a background in residential energy inspections and testing.
2. Attest to knowledge and understanding of the EPA ENERGY STAR Certified Homes, EPA Indoor airPLUS Certified Homes, and a DOE Zero Energy Ready Homes programs.

E-2.1.2 Phius Certified Rater Certification

To become a Phius Certified Rater and serve as a Phius Certified Rater on a project, one must:

a. Pass the Phius Certified Rater Exam
b. Sign the Phius Certified Rater Agreement

c. Remain an active Phius Certified Rater.

For projects where no Phius Certified Verifier is within 200 miles of project, but a Phius Certified Rater is within 200 miles of the project, a Phius Certified Rater may serve as the Phius Certified Verifier on the project so long as they are approved by Phius for the project in question.

E-2.1.3 Phius Certified Rater Renewal

Phius Certified Rater credentials expire 3 years after their original certification date. To extend the credential another 3 years, a Rater must:

Complete **1 of 3** items below:

1. Obtain 12 Phius CEUs before their expiration date.
   - CEUs can be earned from any Phius-hosted, Phius Alliance-hosted, or Phius CEU-approved event.
2. Complete a Phius Certified project as the Phius Certified Rater.
3. Take and Pass the Phius Certified Rater Re-Certification Exam.

To maintain their database listing, each year, a Phius Certified Rater must also:

- Log into the Phius Portal, review their RESNET Status and Provider information, update as needed, and certify that the information is accurate. (Exception: CA and AK Raters must confirm status with their state sponsored ratings systems and providers)

E-2.1.4 Phius Certified Rater Expiration

Phius Certified Rater credentials expire every three years. A Rater who fails to meet the requirements outlined in E-2.1.3 above will be removed from the professional's database.

E-2.1.5 Phius Certified Rater Re-Activation

A professional whose Rater status has expired can reactivate certification by applying for and passing Phius Certified Rater Re-Certification Exam.

E-2.2 Phius Certified Verifier Information

The Phius Certified Verifier training course is geared toward non-residential and multifamily building professionals. The course will be open to any potential candidates. Actual certification and earning the professional title of Phius Certified Verifier will be contingent upon applying for and passing the Phius Certified Verifier Exam.

As a baseline, earning the Phius Certified Verifier designation will qualify the professional to verify non-residential buildings. To become qualified to verify multifamily buildings, additional prerequisites must be met. Phius will review these prerequisites in the application submitted by the candidate for the exam to earn the multifamily designation. There will be an identifier for professionals with the Multifamily designation in the professional's database.

E-2.2.1 Phius Certified Verifier Exam Eligibility

The Phius Certified Verifier exam has two options: Baseline and Baseline + Multifamily Designation. The Baseline must be taken by all wishing to achieve certification. Those wishing to qualify for multifamily projects must take and pass the additional multifamily exam.

The following documentation must be provided when applying for the exam:

Prerequisite to take Phius Certified Verifier Exam (Baseline):

a. Completion of Phius Certified Verifier Course
b. Proof of verification and/or commissioning experience for commercial, non-residential, or multifamily buildings

Prerequisite to add the Multifamily Designation:

c. Compliance with Path A or Path B below:
    - **Path A:** Proof all prerequisites for Phius Certified Rater (Outlined in Section E-2.1.1)
    - **Path B:** Proof of RESNET Field Inspector (RFI) status
d. Proof of completion of Energy Star Multifamily New Construction V 1/1.1 Rater Training Course

E-2.2.2 Phius Certified Verifier Certification

To become a Phius Certified Verifier and serve as a Phius Certified Verifier on a non-residential project, one must:

a. Pass the Phius Certified Verifier Exam
b. Sign the Phius Certified Verifier Agreement
c. Remain an active Phius Certified Verifier

To serve as a Phius Certified Verifier on a multifamily project, one must:

a. Pass the Phius Certified Verifier Exam
b. Pass the Phius Certified Verifier Multifamily Designation Exam
c. Sign the Phius Certified Verifier Agreement
d. Remain an active Phius Certified Verifier

If a Phius Certified Verifier without the multifamily designation wishes to verify multifamily projects, they can apply to take the Phius Certified Verifier Multifamily Designation Exam at any time and must meet all pre-requisites for that as outlined above.

E-2.2.3 Phius Certified Verifier Renewal

Phius Certified Verifier credentials expire 3 years after their original certification date. To extend the credential another 3 years, a Verifier must:

Complete **1 of 3** items below:

1. Obtain 12 Phius CEUs before their expiration date.
   - CEUs can be earned from any Phius-hosted, Phius Alliance-hosted, or Phius CEU-approved event.
2. Complete a Phius Certified project as the Phius Certified Verifier.
3. Take and Pass the Phius Certified Verifier Re-Certification Exam.

On top of this, each year Verifiers with the Multifamily Designation who wish to keep this designation in their database listing must:

- Log into the Phius Portal, review their RESNET Status and Provider information, update as needed, and certify that the information is accurate. *(Exception: CA and AK Raters must confirm status with their state sponsored ratings systems and providers)*

E-2.2.4 Phius Certified Verifier Expiration

Phius Certified Verifier credentials expire every three years. A Verifier who fails to meet the requirements outlined in E-2.2.3 above will be removed from the professional's database.

E-2.2.5 Phius Certified Verifier Re-Activation

A professional whose Verifier status has expired can reactivate certification by applying for and passing the Verifier Re-Certification exam (baseline or baseline + multifamily designation).

E-2.3 Non-Certified Inspectors

Where no Phius certified professional is within 200 miles of a project, a project may elect to use a non-Phius certified professional to perform site inspections and testing if approved by Phius Staff.

Requirements are outlined below:

1. Non-certified inspectors shall meet the eligibility requirements for either Phius Certified Rater or Verifier, other than having attended the training.
2. Non-certified inspectors shall contract with and work directly under the supervision of an existing certified Phius Certified Rater or Verifier.
   a. This relationship shall require at a minimum that the Phius Certified professional conducts virtual training on the Phius Workbook and testing standards, and reviews all documentation issued by the Phius Certified Verifier/Rater detailing their inspection and testing protocol.
   b. The Phius certified professional shall complete a letter of attestation to this training/mentorship. Letter of Attestation can be downloaded here.

Alternatively, where a Phius Certified Rater or Verifier has other verification staff who are otherwise qualified but are not yet Phius certified professionals, they may be permitted to perform verification so long as:

1. The Phius Certified Rater/Verifier takes full responsibility for their verification work.
2. The Phius Certified Rater/Verifier completes a letter of attestation of training/mentorship on Phius-specific verification scopes of work.
3. The candidate otherwise meets all the other eligibility criteria. At a minimum, the not yet Phius certified professionals should at least be certified as RESNET HERS Rater.

E-3.0 Pre-Construction Requirements

E-3.1 Contracting with a Project

A project team attempting Phius certification for a project will contract with a Phius Certified Rater or Verifier prior to construction, and ideally while the project is in design phase. Phius recommends the project team will contract with a Phius Certified Rater or Verifier as early in the design process as possible.

Contracts can be entered into between the Rater/Verifier and any member of the project team. Preferably, but not a requirement, the contract will be with the project owner so that the Rater/Verifier can remain fully independent of the construction and design teams.

Phius Certified Rater/Verifiers cannot serve as the CPHC or builder on a project in which they are performing verification. However, another member of the Rater/Verifier's company may perform this scope with prior written approval from Phius certification staff.

E-3.2 Project Team Training

While it is ultimately the responsibility of the project team to ensure a project is fully compliant with Phius certification requirements, it is the Rater/Verifier's responsibility to ensure that all critical project team members understand the Phius Certification process, program requirements, and individual requirements from partner programs such as the EPA ENERGY STAR Certified Homes, EPA ENERGY STAR Multifamily New Construction Program, EPA Indoor airPLUS and DOE Zero Energy Ready Homes programs.

It is not the responsibility of the Rater/Verifier to train builders, building subcontractors, designers, or any other project team member on specific scopes of work to construct Phius compliant projects, other than to make them aware of the requirements listed in the Phius Workbook or allied documents. The Rater/Verifier may choose to provide such guidance at their own discretion.

E-3.3 Design Review

It is encouraged that the Phius Certified Rater/Verifier be present at design review meetings with the project team where possible.

While it is not the responsibility that the Rater/Verifier provide guidance or feedback on the design, it may be helpful where the Rater/Verifier has valuable experience to offer project team members.

- Any guidance on design/implementation strategies shall be given at their own discretion.
- It is encouraged that Phius Certified Rater/Verifiers carry a minimum of $500,000 professional liability insurance if giving specific design or construction guidance.

E-4.0 Technical Inspection and Field Requirements

E-4.1 Mid-Construction Inspections

A minimum of two mid-construction inspections shall be required; one at foundation phase to verify foundation insulation systems, and another pre-drywall. Photo documentation is required.

- RESNET Standards and program requirements for Energy Star Certified Homes and Energy Star Multifamily New Construction Program require a minimum number of inspections to verify projects. Please ensure the work scope for services includes the minimum number of required inspection visits.
- More frequent inspections and testing may be required or requested by project team depending on project scope, and if agreed upon by Rater/Verifier.

1. **Foundation Inspection** – the following shall be observed at this phase:
    a. Slab (both edge and under) and foundation wall insulation materials and thicknesses and R-values
    b. Radon mitigation system piping (where applicable)
    c. Foundation drainage systems (where applicable)
    d. Presence of any known or unintended thermal bridges and associated mitigation strategies
    e. General site slope/grading
2. **Pre-drywall Inspection** – the following shall be observed at this phase:
    a. Foundation and above grade wall cavity insulation and R-values (where applicable)
    b. Foundation and above grade wall continuous insulation and R-values
    c. Air sealing/air barrier details
    d. Insulation inspections to verify material type, R-value and installation grade. If insulation material is not marked such as with blown in or spray applied materials, ESR reports shall be collected and used to validate the installed R-value. Insulation Grading and evaluation shall be in compliance with ANSI/RESNET/ICC Standard 301-2019 Appendix A “Insulation Grading”
    e. Presence of any known or unintended thermal bridges and associated mitigation strategies

f. Window specification, NFRC data or equivalent data, rough opening sizes, location, overhangs, shading and install condition. Verification of window performance shall be collected and can consists of published NFRC data, photos of NFRC labels, Shop Drawings, Manufacturer's Data, or other evidence of the installed window(s).
g. Mid-construction air tightness test (optional). Note Phius CORE 2021 Prescriptive path for SF homes REQUIRES a mid-construction air tightness test. Refer to the Phius 2021 Program requirements for more details.

E-4.2 Final Inspection and Testing

Once final construction is substantially complete, the Rater/Verifier shall perform the following measures.

E-4.2.1 Verification

The following shall be verified at final:

a. Ceiling R-values and any other insulation not previously verified
b. Distance and R-value of ventilation ducts to exterior
c. Window overhang, external and adjacent shading attributes
d. Final site grading
e. Radon mitigation system final installation (where applicable)
f. Mechanical system make/models
g. Appliance make/models
h. Lighting efficiency percentages
i. Major process loads or other electrical loads (where applicable)
j. On-site renewable energy systems
k. Infrared Inspection of interior and exterior of building
l. All other mandatory ENERGY STAR, Indoor airPLUS, Zero Energy Ready Home or Phius requirements.

E-4.2.2 Testing

All testing required per the applicable Phius Workbook shall be used, including:

E-4.2.2.1 Whole-building airtightness

a. Conducted in both pressurization and depressurization modes
b. Using multipoint testing that meets either the provisions of:
    1. ANSI/RESNET/ICC 380-2019, or The Air Barrier Association of America Standard Method for Building Enclosure Airtightness Compliance Testing
    2. Measured Infiltration air flow test results shall indicate a standard level of accuracy test result or have an accuracy within 10%.
    3. The Test Reports shall indicate a Correlation Coefficient of 0.95 or greater.

E-4.2.2.2 Duct leakage testing (where applicable)

a. Only required for dwelling unit heating and cooling ducts >10' total system length. It is encouraged that duct testing be conducted at rough-in stage before concealment. Note: RESNET MINHERS Standards requires duct Leakage to Outside to be measured.
b. Testing to be conducted in accordance with ANSI/RESNET/ICC 380-2019
c. For ventilation systems, common space systems, and non-residential systems, duct testing may be required by the Energy Star Multifamily New Construction Program. Phius recommends this as a valuable diagnostic tool to ensure proper airflow and balancing can be achieved.

E-4.2.2.3 Ventilation system testing

a. Room-by-room balancing
    1. Testing can be performed using devices such as the Retrotec Flow Finder, Energy Conservatory Flowblaster, Energy Conservatory Exhaust Fan Flow Meter (for flows under 100 CFM), Testo 417 (for flows under 100 CFM) with flow straightener and capture hood, CFM-range appropriate non-powered flow hood, and duct tester device with custom capture hood attachment.
        i. Any other device or methodology must be preapproved by Phius and listed in ANSI/RESENT/ICC Standard 380-2019.
    2. Alternatively, a certified third-party air balancer or product commissioning agent can provide a detailed air balancing report in lieu of the Rater performing this task. A minimum number of airflows are to be verified separately by the Rater or Verifier per the QA Workbook requirements.
        i. For MF verification of 3rd party air-balancer work, see the most current version of the Energy Star Multifamily New Construction Program documents.
b. Total ventilation system airflow at unit (supply & exhaust) at maximum speed setting/capacity.
    1. Used to determine if recommended 0.3 ACH can be achieved.
c. Total ventilation system airflow at unit (supply & exhaust) at typical operation
    1. Total supply and exhaust shall be least 100% of the design values and within 10% of each other.
    2. Individual room supply and exhaust airflows shall be at least 100% of the design values and no more than 10% greater than design values.
        i. Note minimum exhaust airflows are mandated per Ventilation requirements outlined in Section 3 of the Guidebook.
    3. Alternatively, measurements of the outdoor air inlet and exhaust outlet of the ventilation system can be made on the exterior of a building using a pressure matching tool such as a duct tester or powered flow hood, so long as:
        i. Measurements can be made safely

ii. The ducts connecting the system to outside are well sealed
iii. Environmental conditions (wind) will not adulterate the test results.
iv. Ventilation in/outlets are possible to test without building products or architectural features interfering.

d. Power consumption measurement recorded in watts for ventilation units in typical 24/7 mode using of the following methods:
    1. Using a power-factor adjusted wattage clamp meter, such as the Amprobe NAV-51, tested at the electrical panel or other accessible location
    2. Using a plug-in watt meter such as the Kill-a-Watt, so long as the system has an electrical plug
    3. Using measured total system airflow or external static pressure and a manufacturer's fan curve table
    4. Alternatively, this may be tested by a third-party balancing firm, HVAC contractor or electrician.

E-4.2.2.4 Heating and cooling system airflow testing

a. Room-by-room balancing, see ventilation provisions above
b. Total system airflow, see ventilation provisions above

E-4.2.2.5 Bedroom *pressure* balancing

a. Ducted heating and cooling systems
    1. Bedrooms shall be pressure balanced to +/- 3 Pa with respect to (WRT) the main body of the house with all other bedroom doors closed and the system running
b. Ventilation systems
    1. Bedrooms shall be pressure balanced to +/- 1 Pa with respect to (WRT) the main body of the house with all other bedroom doors closed and the ventilation system running.

E-4.2.2.6 Hot water distribution system testing

Hot Water Temperature Rise Test shall be conducted for all single family projects and at a minimum sampled for dwelling units in all multifamily projects per the DOE ZERH Mandatory Requirements for Water Efficiency.

DOE ZERH Water Efficiency Requirements has 2 compliance options.

1. Measuring the temperature of the hot water stream, no more than 0.6 gallons (or 1.4 gallons under the Alternative Compliance Option) shall be emitted before the hot water temperature increases by 10 deg. F.

    I. Without priming the hot water pipes (i.e., do not turn on the hot water tap for a minimum of 2 hours ahead of time), measure the temperature of the hot water stream at the hot water fixture that contains the highest volumetric water

content from water heater. This is often, but not always, the longest hot water plumbing run from the water heater.

II. Hot water shall be captured using a bucket, pitcher, or plastic bag with 0.6 gallons (1.4 gallons for Alternative Compliance Option) marked.

III. It is recommended to use either an infrared camera or a digital thermometer to check the temperature rise of the water.

2. The DOE ZERH Water Efficiency Alternative Compliance Option, wherein the Rater or Verifier shall confirm and provide documentation that the water heater and fixtures meet the criteria listed.

E-4.3 Documentation

All inspections and testing shall be documented using the most current version of the Phius Workbook that was available when the project was initially registered with Phius (based on contract date, see 'Program Version Dates' section above).

Additional documentation that shall be provided include:

1. Multi-point automated testing software reports or digital files
2. Ventilation and heating/cooling balancing reports (if not in Workbook)
3. HERS energy modeling software files or Building Summary/Building File Report pdfs. Exceptions - not required for:
    a) CA, AK, or international projects
    b) Multifamily projects certified to Energy Star MFNC under the Prescriptive or ASHRAE/Alternative Phius Path
    c) Non-Residential Projects
4. Clearly labeled photos, including a minimum of:
    a) Foundation insulation
    b) Air sealing details
    c) Above-grade insulated assemblies
    d) Known thermal-bridges and/or mitigation strategies
    e) Surrounding site and window shading systems
    f) Representative thermal images demonstrating no unexpected thermal bypasses
    g) Appliance tags clearly showing model and serial number
    h) All HVAC equipment nameplates clearly showing model and serial numbers;
        i. Ventilation equipment
        ii. Hot water heater
        iii. Air handlers and coils
        iv. Ductless heads
        v. Condensers

i) All other mechanical equipment such as for central systems and process equipment

5. Indoor airPLUS low-emitting products documentation
    i. While it is not necessarily the responsibility of the Rater/Verifier to verify compliance with all the IAP low emitting products requirements, it is necessary for the builder to provide documentation and attestation that all products are compliant.
    ii. It is recommended that the Rater/Verifier work with the builder to develop a list of affected products, and to educate them on verifying compliance with these program requirements.

E-5.0 Post-Construction Requirements

All projects shall be documented as described above. This documentation shall be communicated to the project team so that any appropriate adjustments can be made to the Phius energy model.

a. For Single family and multi-family projects that include a formal HERS Rating, it is recommended that specific building characteristics be reviewed and coordinated with the Certified Passive House Consultant (CPHC).
    a. Overall iCFA
    b. Net Volume
    c. Building Envelope area
    d. Window areas & NFRC performance data
b. After communicating documentation to the project team and final updates made to the Phius energy model, either the Rater/verifier or a member of the project team shall notify Phius certification staff that the proje ct is ready for final review.
c. Documentation shall be submitted to the shared Dropbox folder established by Phius for the project. Phius may request additional documentation where necessary.
d. Phius certification staff shall review final documentation of project and compare to the WUFI Passive energy model and intended project specifications.
    1. Where questions arise, or changes are necessary to be made for consistency, Phius certification staff shall communicate this information to the Rater/Verifier, and or the project team where applicable to make updates.
    2. The Rater/Verifier shall use this information to make any necessary adjustments and shall resubmit all project documentation to Phius certification staff for final approval.

E-6.0 Resources

Download the latest documents from this page:

1. Phius Multi Family Quality Assurance Workbook
2. Phius Single Family Quality Assurance Workbook
3. Phius Non-Residential Quality Assurance Workbook
4. Phius Certification Guidebook
5. Phius Multifamily Quality Assurance Protocol
6. Phius Certified Rater/Verifier Mentorship Letter of Attestation