# Quality Control Field Checklist, v24.1.0

*(August 2024)*

**Project #_____ Project Name_____ City_____ State_____**

## 1 - Building Envelope

| | | | |
|---|---|---|---|
| **1.0** | **Site Photos**<br>***Scan QR Code to view examples of site photos, Don'ts and Do's:*** | | |
| **1.0.1** | **Insulated Assemblies:** | **Rater/Verifier Confirmed** | **N/A** |
| | Take photos of all insulated assemblies, to include measured insulation thickness and material type. Include photos that show context and clearly show depth, quality, and area(s) insulated. Save photos to Section 4 of the Phius On-Site QA folder | | |
| **1.0.1.1** | **Footings** | ☐ | ☐ |
| **1.0.1.2** | **Foundation Wall** | ☐ | ☐ |
| **1.0.1.3** | **Slab (including perimeter)** | ☐ | ☐ |
| **1.0.1.4** | **Framed Floor** | ☐ | ☐ |
| **1.0.1.5** | **Above-Grade Wall (interior and exterior insulation as applicable)** | ☐ | ☐ |
| **1.0.1.6** | **Ceiling/Attic (interior and exterior insulation as applicable)** | ☐ | ☐ |
| **Notes:** | | | |
| **1.0.2** | **Windows & Doors:** | **Rater/Verifier Confirmed** | **N/A** |
| | Take a photo of the NFRC label, if available. Include photos that show window installed, U-value, and SHGC. Save photos to Section 4 of the Phius On-Site QA folder. If NFRC data is not available, see requirements within the Key Documents tab, Building Envelope section of the Rater/Verifier Workbook. | | |
| **1.0.2.1** | **NFRC label on Fixed Window(s)** | ☐ | ☐ |
| **1.0.2.2** | **NFRC label on Operable Window(s)** | ☐ | ☐ |
| **1.0.2.3** | **NFRC label on Skylight (s)** | ☐ | ☐ |
| **1.0.2.4** | **NFRC label on Glazed Door(s)** | ☐ | ☐ |
| **1.0.2.5** | **Photo of Opaque Door(s)** | ☐ | ☐ |
| **1.0.2.6** | **Photo of exterior access doors (roof access, attic access, etc.)** | ☐ | ☐ |
| **Notes:** | | | |
| **1.0.3** | **Infrared Photos:** | **Rater/Verifier Confirmed** | **N/A** |
| | Perform a thorough IR scan of the building thermal envelope. Provide representative photos, including, but not limited to: areas of walls, corners, window frames, suspended floors, overhangs, and roofs. Include photos that indicate any thermal bridges. Save photos to Section 4 of the Phius On-Site QA folder. | | |
| **1.0.3.1** | **Above-Grade Walls** | ☐ | ☐ |
| **1.0.3.2** | **Ceiling/Attic** | ☐ | ☐ |
| **1.0.3.3** | **Window Installed** | ☐ | ☐ |
| **1.0.3.4** | **Framed Floor over unconditioned spaces** | ☐ | ☐ |
| **Notes** | | | |
| **1.0.4** | **General Exterior:** | **Rater/Verifier Confirmed** | **N/A** |
| | Take exterior photos of each elevation and significant architectural features including, balconies, overhangs and shading devices. Take photos of the areas surrounding, and adjacent to the building. Include photos that show any nearby structures, natural features or vegetation that can cause shading on the building. Save photos to Section 4 of the Phus On-Site QA folder. | | |
| **1.0.4.1** | **Radon system piping (where applicable)** | ☐ | |
| **1.0.4.2** | **Photos of Each Exterior Elevation** | ☐ | |
| **1.0.4.3** | **Overhangs & Shading** | ☐ | |
| **1.0.4.4** | **Surrounding Site and adjacent obstructions** | ☐ | |
| **Notes:** | | | |

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| | | | | |
|---|---|---|---|---|
| 1.1 | **Field Verification**<br>***Rater/Verifier is responsible for verifying the tasks below have been completed:*** | | | |
| 1.1.1 | **Architectural Features, Insulation, and Thermal Bridging** | Rater/Verifier Confirmed | N/A | PROG REQ. |
| 1.1.1.1 | **Drawings Check:** Describe any significant variations in construction from the construction drawings and specifications (insulation, window sizes, window performance, fixed shading etc.). | ☐ | ☐ | ALL |
| Notes: | | | | |
| 1.1.1.2 | **Framing Inspection:** Framing matches architectural plans (depth & spacing, e.g., 2x6 16" O.C.). If not, please describe in notes section below. | ☐ | ☐ | ALL |
| Notes: | | | | |
| 1.1.1.3 | **Operable Shading:** If operable shading has been installed, describe operable shading. | ☐ | ☐ | ALL |
| Notes: | | | | |
| 1.1.1.4 | **Insulation R-Value:** All insulation R-values match those listed on architectural plans. If not, please describe in notes section below. | ☐ | ☐ | ALL |
| Notes: | | | | |
| 1.1.1.5 | **Insulation Quality Check:** All insulated assemblies have achieved a RESNET Grade I cavity insulation level, or alternatively Grade II with continuous insulation. | ☐ | ☐ | ENERGY STAR |
| Notes: | | | | |
| 1.1.1.6 | **Fastener Quality Check:** In the box below, describe the material of fastener used to install exterior insulation (aluminum, mild steel, stainless steel, plastic, etc.). | ☐ | ☐ | Phius |
| Notes: | | | | |
| 1.1.1.7 | **Thermal Bridging/mitigation strategy identification:** In the box below, Rater/Verifier has noted any thermal bridges in the assembly observed on the project and strategies used for mitigation. Describe and provide photo documentation where such details are missed. | ☐ | ☐ | Phius |
| Notes: | **Describe any thermal bridges present and/or mitigation strategies:** | | | |
| 1.1.2 | **Whole Building Airtightness Testing:** | Rater/Verifier Confirmed | N/A | PROG REQ. |
| 1.1.2.1 | **Mid-Construction Airtightness Testing:** This is an optional, but recommended test. (This test is required for Phius Prescriptive Path projects.) | ☐ | ☐ | Phius |
| 1.1.2.2 | **Final Airtightness Testing:** Conduct multi-point blower door tests for depressurization and pressurization, following building set-up per Phius Certification Guidebook & ANSI/RESNET/ICC Std 380-2022. Enter data into Building Envelope tab of the QA Workbook and upload testing report into Section 4 of the Phius On-Site QA folder. | ☐ | | |
| Notes: | | | | |

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| 1.1.3 | Compartmentalization Airtightness Testing: | Verifier Confirmed | N/A | PROG REQ. |
|---|---|---|---|---|
| 1.1.3.1 | **Requirements:** Required for Townhouse & multifamily dwelling units. | ☐ | ☐ | |
| 1.1.3.2 | **Compartmentalization Airtightness Testing:** Conduct compartmentalization airtightness testing of individual dwelling units in accordance with Phius Guidebook and ANSI/RESNET/ICC Std 380-2022. The maximum air leakage shall be 0.3 CFM50/sq ft** of dwelling unit Envelope Surface Area. Enter results into the Building Envelope tab of the QA Workbook.<br><br>** Note 0.3 CFM50/sq ft shall be the target rate until such time EPA or DOE programs require a tighter value. | ☐ | ☐ | Phius |
| **Notes:** | | | | |

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**Project #**_____ **Project Name**_____ **City**_____ **State**_____

## 2 – Ventilation

| | | | |
|---|---|---|---|
| **2.0** | **Site Photos**<br>***Scan QR Code to view examples of site photos, Don'ts and Do's:*** | | |
| **2.0.1** | **Site Photos of Ventilation Systems:** | **Rater/Verifier Confirmed** | **N/A** |
| | Take photos of each installed ventilation system and auxiliary ventilation system defrost equipment (electric, hot water loop from DHW tank, and ground loop) and nameplate (manufacturer, model number). Include photos that show context. Save photos to documentation folder. | | |
| **2.0.1.1** | **HRV or ERV** | ☐ | |
| **2.0.1.2** | **Auxiliary Ventilation Equipment** | ☐ | ☐ |
| **Notes:** | | | |

| | | | | |
|---|---|---|---|---|
| **2.1** | **Field Verification**<br>***Rater/Verifier is responsible for verifying the tasks below have been completed:*** | | | |
| **2.1.1** | **General:** | **Rater/Verifier Confirmed** | **N/A** | **PROG REQ.** |
| **2.1.1.1** | Ventilation air inlets and outlets for projects in Climate Zones 4-8 are installed ≥ 4' above grade and/or roof deck. | ☐ | ☐ | Phius |
| **2.1.1.2** | Ventilation air comes directly from outdoors, not from adjacent dwelling units, common spaces, garages, crawlspaces, or attics. | ☐ | ☐ | |
| **2.1.1.3** | Outside supply air passes through a minimum MERV 8 filter prior to distribution. | ☐ | ☐ | |
| **2.1.1.4** | Filter is located to facilitate regular service by the occupant and/or building superintendent. | ☐ | ☐ | |
| **2.1.1.5** | Class 1 vapor retarder is installed over all air-permeable insulation (such as fiberglass duct wrap) on ventilation ducts connected to outside. Vapor retarder is continuous and sealed to building air barrier and ventilation unit with no gaps, breaks or holes. | ☐ | ☐ | |
| **2.1.2** | **Kitchens:** | **Rater/Verifier Confirmed** | **N/A** | **PROG REQ.** |
| **2.1.2.1** | ERV/HRV exhaust register installed ≥ 6' from the nearest edge of the cooktop. ("stretched-string distance") | ☐ | ☐ | Phius |
| **2.1.2.2** | **Designate which type of filter was installed:** | | | |
| **2.1.2.2.1** | MERV 3+ filter for trapping grease at ERV/HRV exhaust register. | ☐ | ☐ | |
| **2.1.2.2.2** | Washable mesh filter for trapping grease in range hood. | ☐ | ☐ | |
| **2.1.2.3** | **Installed range hood is one of the following (select one):** | | | |
| **2.1.2.3.1** | Recirculating hood over range. | ☐ | ☐ | |
| **2.1.2.3.2** | Range hood exhausted directly to outside. | ☐ | ☐ | |
| **2.1.2.4** | **Measured kitchen direct exhaust rates meets one of the following (select one or more):** | | | |
| **2.1.2.4.1** | Meets Energy Star, IAP, and ZERH requirements for minimum kitchen exhaust airflow. | ☐ | ☐ | |
| **Notes:** | | | | |

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| 2.1.3 | **Bedrooms:** | | Rater/Verifier Confirmed | N/A | PROG REQ. |
|---|---|---|---|---|---|
| 2.1.3.1 | **Provision made to supply outdoor air to all bedrooms in dwelling units and comply with either 2.1.3.1.1 or 2.1.3.1.2. If complying with 2.1.3.1.1, skip to 2.1.3.2.** | | | | Phius |
| | **2.1.3.1.1** | Dedicated outdoor air supply ventilation ductwork installed to all bedrooms. | ☐ | ☐ | |
| | **2.1.3.1.2** | Outdoor air supply ventilation ductwork integrated with heating/cooling ductwork and is connected directly to the return plenum of the air handler (also complies with 2.1.3.1.2.1 and 2.1.3.1.2.2). | ☐ | ☐ | |
| | **2.1.3.1.2.1** | ERV/HRV remains in balance under all fan speeds of the heating/cooling air handler. | ☐ | ☐ | |
| | **2.1.3.1.2.2** | Air handler fan designed to run continuously by default. Air handler power (Watts) added to ventilation power (Watts), in calculation of W/cfm, and meets DOE ZERH efficacy requirements. | ☐ | ☐ | |
| **2.1.3.2** | Bedrooms are pressure balanced to achieve a Rater/Verifier measured pressure difference of +/- 1 Pa with respect to the main body of the dwelling unit when all bedroom doors are closed and only the ventilation system is operating at design speed. | | ☐ | ☐ | |
| **Notes:** | | | | | |

| 2.1.4 | **Bathrooms:** | | Rater/Verifier Confirmed | N/A | PROG REQ. |
|---|---|---|---|---|---|
| 2.1.4.1 | **Measured bathroom exhaust rates meets one of the following (select one):** | | | | Energy Star |
| | **2.1.4.1.1** | ≥20cfm continuous. | ☐ | ☐ | |
| | **2.1.4.1.2** | ≥50 cfm intermittent. | ☐ | ☐ | |

| 2.1.5 | **Ventilation Auxiliary Systems:** | Rater/Verifier Confirmed | N/A | PROG REQ. |
|---|---|---|---|---|
| 2.1.5.1 | If installed, enter type of ERV/HRV defrost - electric, hot water loop from DHW tank, ground loop into the Ventilation tab of the Workbook. | ☐ | ☐ | Phius |
| 2.1.5.2 | Project team has demonstrated the defrost control logic is set up properly. | ☐ | ☐ | |

| 2.1.6 | **Ventilation System Airflow Testing:** | Rater/Verifier Confirmed | Builder Confirmed | N/A | PROG REQ. |
|---|---|---|---|---|---|
| 2.1.6.1 | **ERV/HRV Ventilation System Airflow Testing:** Conduct ventilation system airflow testing. Enter data into Ventilation tab of QA Workbook, and provide testing report in Section 4 of the Phius On-Site QA folder, if available. | ☐ | ☐ | ☐ | Phius |
| 2.1.6.2 | **Auxiliary Exhaust Ventilation System Airflow Testing:** Conduct ventilation system airflow testing, enter data into Ventilation tab of QA Workbook, and provide testing report in documentation folder, if available. | ☐ | ☐ | ☐ | |
| **Notes:** | | | | | |

# Quality Control Field Checklist, v24.1.0

*(August 2024)*

**Project #**_____ **Project Name**_____ **City**_____ **State**_____

## 3 – Heating & Cooling

| | | | |
|---|---|---|---|
| **3.0** | **Site Photos**<br>***Scan QR Code to view examples of site photos, Don'ts and Do's:*** | | |
| **3.0.1** | **Site Photos of Heating & Cooling Systems:** | **Rater/Verifier Confirmed** | **N/A** |
| | Take photos of each installed heating & cooling system and nameplate (manufacturer, model number). Include photos that show equipment and nameplate. Save photos to Section 4 of the Phius On-Site QA folder. | | |
| **3.0.1.1** | **Heating & Cooling System** | ☐ | |
| **Notes** | | | |

| | | | | |
|---|---|---|---|---|
| **3.1** | **Field Verification**<br>***Rater/Verifier is responsible for verifying the tasks below have been completed:*** | | | |
| **3.1.1** | **Combustion Equipment:** | **Rater/Verifier Confirmed** | **N/A** | **PROG REQ.** |
| **3.1.1.1** | If combustion equipment for space heating is included in the project, provide a dedicated branch circuit, in compliance with DOE ZERH v2 NPR Exhibit 1, Item 11. Branch circuit shall be labeled "For Future Heat Pump Space Conditioning." | ☐ | ☐ | Phius |
| **3.1.1.2** | Combustion furnaces, boilers and/or water heaters located within the buildings' pressure boundary are sealed combustion, direct-vent appliances. | ☐ | ☐ | |
| **3.1.1.3** | Natural draft fireplaces are not installed. | ☐ | ☐ | |
| **3.1.1.4** | Installed woodstoves have a combustion air inlet connected to the firebox. | ☐ | ☐ | |
| **3.1.2** | **Controls:** | **Rater/Verifier Confirmed** | **N/A** | **PROG REQ.** |
| **3.1.2.1** | Heating/Cooling System Fan - air flow is produced when thermostat is set to "fan on", Heated air flow is produced when thermostat is set to "Heat", Cooling air flow is produced when thermostat is set to "Cool". | ☐ | ☐ | Phius |
| **3.1.3** | **Condensation Management:** | **Rater/Verifier Confirmed** | **N/A** | **PROG REQ.** |
| **3.1.3.1** | Ensure condensate drain provided for cooling system evaporator coil or a condensate drain is located within 3 feet. | ☐ | ☐ | Phius |
| **3.1.3.2** | Corrosion-resistant drain pan, properly sloped to drainage system is included with each HVAC component that produces condensate. | ☐ | ☐ | |
| **3.1.4** | **Distribution System Layout:** | **Rater/Verifier Confirmed** | **N/A** | **PROG REQ.** |
| **3.1.4.1** | Duct installation reasonably matches design layout. | ☐ | ☐ | Phius |
| **3.1.5** | **Heating/Cooling Distribution System Testing:** | **Rater/Verifier Confirmed** | **N/A** | **PROG REQ.** |
| **3.1.5.1** | **Ducted Heating/Cooling Distribution System Testing:** Conduct leakage testing and balancing of ducted heating/cooling distribution system, enter data into Heat & Cool tab of QA Workbook. Provide TAB report in documentation folder. | ☐ | ☐ | Phius |
| **3.1.5.2** | **Hydronic Heating/Cooling Distribution System Testing:** Collect documentation of testing of hydronic heating/cooling distribution system, enter data into Heat & Cool tab of QA Workbook, and provide report in documentation folder. | ☐ | ☐ | |
| **Notes:** | | | | |

# Quality Control Field Checklist, v24.1.0

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**Project #_____ Project Name_____ City_____ State____**

## 4 – Domestic Hot Water

| | | | |
|---|---|---|---|
| **4.0** | **Site Photos**<br>*Scan QR Code to view examples of site photos, Don'ts and Do's:* | | |
| **4.0.1** | **Site Photos of Domestic Hot Water System:** | **Rater/Verifier Confirmed** | **N/A** |
| | Take photos of each installed domestic hot water system and nameplate (manufacturer, model number). Include photos that show context. Save photos to documentation folder. | | |
| **4.0.1.1** | **Domestic Hot Water Heater** | ☐ | ☐ |
| **4.0.1.2** | **Recirculation Pump and Controls (if applicable)** | ☐ | ☐ |
| **Notes:** | | | |

| | | | | |
|---|---|---|---|---|
| **4.1** | **Field Verification**<br>*Rater/Verifier is responsible for verifying the tasks below have been completed:* | | | |
| **4.1.1** | **Domestic Hot Water System:** | **Rater/Verifier Confirmed** | **N/A** | **PROG REQ.** |
| **4.1.1.1** | Pipe installation **and** insulation reasonably matches design layout. Describe any differences below: | ☐ | ☐ | Phius |
| **Notes:** | | | | |
| **4.1.1.2** | An on-demand recirculation system for DHW was installed per DOE ZERH hot water efficiency requirements. Describe any differences below: | ☐ | ☐ | ZERH |
| **Notes:** | | | | |
| **4.1.1.3** | **If combustion water heating and water heater capacity is less than or equal to 300,000 Btu/hr (88 kW) the following are met:** | | | Phius |
| | **4.1.1.3.1** Complies with DOE ZERH Single Family Homes National Program Requirements or DOE ZERH Multifamily National Program Requirements, Sections 10.1 and 10.2 in the Rater Field Checklist. | ☐ | ☐ | |
| **4.1.1.4** | **If combustion water heating and water heater capacity is greater than 300,000 Btu/hr (88 kW) the following is met:** | | | |
| | **4.1.1.4.1** Provided a branch circuit sized for an electric appliance, equipment or end use with an equivalent capacity that terminates within 6 feet of the appliance or equipment. | ☐ | ☐ | |
| **Notes:** | | | | |

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*(August 2024)*

**Project #_____ Project Name_____ City_____ State_____**

# 5 – Appliances & Electrical Loads

## 5.0 Site Photos

***Scan QR Code to view examples of site photos, Don'ts and Do's:***

| | Site Photos of Appliances | Rater/Verifier Confirmed | N/A |
|---|---|---|---|
| 5.0.1 | | | |
| | Take photos of each installed appliance and nameplate (manufacturer, model number). Include photos that show context. Save photos to documentation folder. | | |
| 5.0.1.1 | **Refrigerator/Freezer/Wine Cooler** | ☐ | ☐ |
| 5.0.1.2 | **Dishwasher** | ☐ | ☐ |
| 5.0.1.3 | **Clothes Washer** | ☐ | ☐ |
| 5.0.1.4 | **Clothes Dryer** | ☐ | ☐ |
| 5.0.1.5 | **Range/Oven Combination** | ☐ | ☐ |
| 5.0.1.6 | **Wall Oven** | ☐ | ☐ |
| 5.0.1.7 | **Cooktop** | ☐ | ☐ |
| 5.0.1.8 | **Exhaust Range Hood** | ☐ | ☐ |
| 5.0.1.9 | **Miscellaneous (e.g., Dehumidifier)** | ☐ | ☐ |
| **Notes:** | | | |

## 5.1 Field Verification

***Rater/Verifier is responsible for verifying the tasks below have been completed:***

| 5.1.1 | Combustion Appliances & Equipment: | Rater/Verifier Confirmed | N/A | PROG REQ. |
|---|---|---|---|---|
| 5.1.1.1 | **Combustion Clothes Dyer:** If combustion clothes drying. A dedicated 240-volt branch circuit with a minimum capacity of 30 amps shall terminate within 6 feet of natural gas clothes dryers and shall be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Electric Clothes Drying" and be electrically isolated. | ☐ | ☐ | Phius |
| 5.1.1.2 | **Combustion Cooking:** If combustion cooking. A dedicated 240-Volt, 40A branch circuit shall terminate within 6 feet of natural gas ranges, cooktops and ovens and be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Electric Range'' and be electrically isolated. | ☐ | ☐ | |
| 5.1.1.3 | **Other Combustion Equipment:** All combustion equipment shall be provided with a branch circuit sized for an electric appliance, equipment or end use with an equivalent capacity that terminates within 6 feet of the appliance or equipment. | ☐ | ☐ | |
| **Notes:** | | | | |

| 5.1.2 | All Other Appliances and Electrical Equipment | Rater/Verifier Confirmed | N/A | PROG REQ. |
|---|---|---|---|---|
| 5.1.2.1 | **Appliances:** Record Manufacturer and Model Number in the Appliances & Electrical tab of the QA Workbook. | ☐ | ☐ | DOE ZERH |
| 5.1.2.2 | **Direct Exhaust Range Hood:** Measure exhaust cfm and record this value into the Ventilation tab of the QA Workbook. | ☐ | ☐ | Phius |
| 5.1.2.3 | **Electrical:** Record any other significant energy use loads in the Appliances & Electrical Loads tab of the QA Workbook. | ☐ | ☐ | |
| **Notes:** | | | | |

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| 5.1.3 | **Lighting** | Rater/Verifier Confirmed | N/A | PROG REQ. |
|---|---|---|---|---|
| 5.1.3.1 | **Lighting:** Installed lighting matches lighting plan - describe variations, if applicable | ☐ | ☐ | Phius |
| **Notes:** | | | | |

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## 6 – Renewables & Electrification

| | | | |
|---|---|---|---|
| **6.0** | **Site Photos**<br>***Scan QR Code to view examples of site photos, Don'ts and Do's:*** | | |
| **6.0.1** | **Site Photos of Renewables & Electrification:** | **Rater/Verifier Confirmed** | **N/A** |
| | Take photos that document the renewables and electrification. Include photos that show context. Save photos to documentation folder. | | |
| **6.0.1.1** | **Solar PV Installed (take photos of inverters and panels).** | ☐ | ☐ |
| **6.0.1.2** | **Electric Vehicle Supply Equipment (EVSE).** | ☐ | ☐ |
| **Notes:** | | | |

| | | | | |
|---|---|---|---|---|
| **6.1** | **Field Verification**<br>***Rater/Verifier is responsible for verifying the tasks below have been completed:*** | | | |
| **6.1.1** | **Renewable Energy Systems:** | **Rater/Verifier Confirmed** | **N/A** | **PROG REQ.** |
| **6.1.1.1** | **Solar Thermal System:** Ensure installed solar PV system corresponds with shop drawings or purchase order, and document in the Renewables & Electrification tab of the QA Workbook. | ☐ | ☐ | Phius |
| **6.1.1.2** | **Solar Photovoltaic System** Ensure installed solar PV system corresponds with shop drawings or purchase order, and document in the Renewables & Electrification tab of the QA Workbook. | ☐ | ☐ | |
| **Notes:** | | | | |

| | |
|---|---|
| **Rater/Verifier Name (Printed):** | |
| **Signature:** | |
| **Date:** | |