**Solar Electric Technician (Level 2)**

**Module 5: Installation and assembly**

**E3: Assignment - Assembly of slope roof mount/pole mount structures**

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| **E3: ASSIGNMENT MEMO** | |
| **Date** | …. |
| **To** | Participants |
| **From** | Trainers |
| **Subject** | Assembly of slope roof mount/pole mount structures. |
| **What** | Learn how to assemble the parts and accessories of a roof mount/pole mount structures. |
| **Why** | To enable participants to perform roof mount/pole mount installation of solar support structures. |
| **How** | 1. Group of 2 or 4. 2. As per the given site condition and drawing, identify the parts of accessories. used in solar support structure and perform installation. 3. Answer the questions and discuss the results. |
| **Time** | 120’ |

**For the given drawings, participate in the installation of slope roof mount /pole mount solar support structures.**

1. **Required tools/equipment**

* Pen and paper
* Structural drawings
* Wrenches
* Screwdrivers
* Drilling machine and drill bits
* Spirit level
* Measurement tape
* Safety harness etc.
* Camera (smartphone) for documentation

1. **Materials provided**

* Roof hooks or brackets
* Mounting rails
* Module clamps (end and mid clamps)
* Fasteners (nuts, bolts, washers)
* Roof flashing (if needed)
* Tools (drill, wrench, screwdrivers, spirit level, etc.)
* Personal Protective Equipment (PPE) for working at height

1. **Instructions**

**Key safety considerations:**

* Avoid stepping on fragile roof materials.
* Always use fall protection equipment.

**Major role of the trainees:**

* Install roof/pole hooks/brackets.
* Attach mounting rails.
* Install module clamps and ensure alignment.
* Ensure proper fastening and perform quality checks.

1. **Follow the step-by-step instructions provided below.**

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| **Steps** | **Instructions** | **Answers/Observations** |
| **Step 1:**  Install roof hooks or brackets at appropriate locations based on the roof/pole structure and module layout. | * Measure and mark positions for the roof hooks according to the drawing. * Lift the roof tiles (if necessary) and secure hooks/brackets to the roof rafters using the provided fasteners. * Ensure that the hooks are properly aligned and securely fastened. * Verify that the roof flashing (if needed) is installed to prevent water leakage. |  |
| **Step 2:**  Attach the mounting rails to the installed roof hooks or brackets. | * Fix the rails to the roof hooks using appropriate fasteners. * Ensure the rails are level and properly spaced to accommodate the solar PV modules. * Use a spirit level to ensure horizontal alignment. * Tighten all bolts and verify the rail stability. |  |
| **Step 3:**  Install mid and end clamps to secure the solar PV modules to the mounting rails. | * Position the mid-clamps between solar modules and end clamps at the edges of the array. * Attach clamps to the rails and ensure modules are securely fastened. * Ensure proper spacing between modules as per the layout drawing. * Double-check that all clamps are properly tightened. |  |
| **Step 4:**  Verify all fasteners are securely tightened and ensure the structure is stable and aligned. | * Re-check all fasteners (roof hooks, rails, clamps) to ensure they are properly tightened. * Use a spirit level to confirm horizontal alignment of rails and modules. * Ensure the entire structure is stable and secure. |  |
| **Step 5:**  Conduct a safety and quality inspection of the completed structure. | * Inspect for any loose components or incorrect installations. * Ensure there are no obstructions to roof drainage or ventilation. * Verify that the structure complies with safety standards, particularly related to working at height. |  |
| **Step 6:**  Group discussion and wrap-up  facilitator-led debrief: | * Discuss common issues encountered during installation and how to address them in real-world projects. * Review safety considerations and highlight best practices when working on sloped roofs. |  |