**Solar Electric Technician (Level 2)**

**Module 4: Site selection for solar PV systems**

**E9: Assignment - Site assessment and installation requirements for cable route planning**

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| **E9: ASSIGNMENT MEMO** | |
| **Date** | …. |
| **To** | Participants |
| **From** | Trainers |
| **Subject** | Site assessment and installation requirement for cable route planning. |
| **What** | Perform and analyse the site assessment for cable route planning. |
| **Why** | To enable participants to understand and identify the key factors involved in planning a cable route for interconnection between components. |
| **How** | 1. Group of 2 or 4. 2. Study the single line diagram. 3. Assess the site for cable route planning, its suitability and requirements. 4. Answer the questions and discuss the results. |
| **Time** | 60’ for each technology (at least two) |

**Finalize the cable route plan for a solar PV system, considering the interconnection between key components**

**Required tools/equipment:**

* Single line diagram
* Compass
* Measuring tape
* Camera (smartphone) for documentation

| **Specific tasks/instructions** | **Findings/Observations/Verifications** |
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| 1. **For solar PV interconnection** | |
| * Discuss and plan the cable route between the PV modules and the PV junction box/combiner box ensuring the route is direct and minimizes voltage drop. |  |
| * Analyse and consider whether the cabling will be underground or overhead to select the appropriate cable. |  |
| 1. **From PV to inverter** | |
| * Finalize the route for cables running from the PV modules to the inverter, the type and capacity of the cable. |  |
| * Ensure the cable route follows the shortest possible path to reduce energy loss. |  |
| * Assess the use of conduits, its mounting provisions to protect the cables from environmental damage. |  |
| 1. **For battery connection** | |
| * Plan the cable route for battery interconnection (if applicable). |  |
| * Ensure safe and efficient routing of cables between individual battery units within the battery bank. |  |
| * Use appropriate cable sizes based on current and voltage requirements and cross check with the manual or technical documentations available |  |
| * Plan the cable route for battery interconnection (if applicable). |  |
| * Ensure safe and efficient routing of cables between individual battery units within the battery bank. |  |
| 1. **For inverter to battery** | |
| * Map the cable route between the inverter and the battery bank. |  |
| * Ensure the cabling can handle the DC current safely (determine size and ampacity) and follow proper safety protocols. |  |
| * Plan for either an underground or overhead route, taking into account site conditions, user’s need and the environment and protection needs. |  |
| * Map the cable route between the inverter and the battery bank. |  |
| 1. **For inverter to main combiner box** | |
| * Discuss the cable route from the inverter to the main combiner box or distribution panel. |  |
| * Ensure that the cables are routed efficiently with minimal bends to avoid unnecessary stress on the wires. |  |
| * Consider the use of conduits for additional protection |  |
| 1. **For pump and pump controller** | |
| * Plan the cable route between the solar water pump and the pump controller ensuring shortest possible route. |  |
| * Ensure that the cable route is protected from water and other environmental hazards. |  |
| * Verify if the cabling will be underground or overhead and plan accordingly |  |
| 1. **For PV to pump controller** | |
| * Discuss the route for cables connecting the PV array to the pump controller. |  |
| * Ensure that the cable size and route can handle the expected voltage and current. |  |
| * Protect cables with conduits, especially if routed underground or in exposed areas. |  |
| 1. **For protection devices cabling** | |
| * Plan the cable route to and from protection devices such as fuses, MCBs, and earthing systems. |  |
| * Ensure that the cable path is safe, direct, and minimizes interference with other cables. |  |
| * Confirm that protection devices are easily accessible for maintenance. |  |
| * Plan the cable route to and from protection devices such as fuses, MCBs, and earthing systems. |  |
| 1. Sketch the layout of cable route and discuss the proposed layout of the cable route between each system component with the system administrator |  |
| 1. Consider how to reduce cable length to improve efficiency and reduce costs. |  |
| 1. Underground: Protects cables from environmental exposure but may require more labour and materials. |  |
| 1. Discuss the type of conduits (PVC, HDPE, GI etc.) required for each cable route |  |
| 1. Ensure all conduits meet local standards for weather resistance and durability. |  |
| 1. Discuss and write down any unique site conditions or installation challenges and how you would address them. |  |