National Commission for Further and Higher Education Malta

National Occupational Standards

Sector	Building & Construction
Job Family	Electrical
Job Title	Assistant Electrical Fitter (Electrician) in assisting in the electrical wiring and the installation of electrical equipment
MQF	Level 2

ALL THE ACTIVITIES BY AN ASSISTANCE ELECTRICAL FITTER (ELECTRICIAN) MUST BE CARRIED OUT UNDER THE SUPERVISION OF A LICENSED ELECTRICAL FITTER (ELECTRICIAN).

To be in line with Subsidiary Legislation 423.39 Electrical Installation Regulation, this National Occupational Standard **EXCLUDES** the following work areas and related competencies:

- the system of distribution of electricity to the public: include roads, traffic lights, high tension;
- marine craft;
- motor vehicles, except those to which the IEE regulations concerning caravans or mobile units are applicable;
- mobile or fixed offshore installations;
- aircraft;
- lightning protection systems;
- plant installation and repair, medical equipment installation and repair;
- electronic/electrical assisted automation systems.

Mandatory Competences

AEE: 201	Apply Occupational Health and Safety and Working Practices
AEE: 202	Assist in the Electrical Installation Work
AEE: 201	Assist in the Maintenance of Electrical Installations and equipment
AEE: 201	Assists in the Testing of Electrical Installations and Equipment and in the Required Documentation

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AEE: 201
Apply Occupational Health and Safety and Working Practices

Description of Unit	This Occupational Standard is about being able to use safe procedures and safe work practices. The persons carrying out this work must possess the necessary knowledge and skills to ensure that their actions do not create health and safety risks to others, identify risks and hazards associated with the working environment, tools and equipment and materials and substances used.

Performance Criteria	The candidate must have the necessary knowledge and skills to: 1. Carry out safe working practices to prevent hazards and to ensure the safety of workers and members of the public. 2. Carry out safe working practices using appropriate equipment and materials to prevent damages to work areas. 3. Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high. 4. Set up safety barriers around a work environment hazard to protect workers and members of the public. 5. Use protective clothing and safety equipment to accomplish tasks. 6. Use and store toxic materials in a safe manner. 7. Locate and manually operate the isolating switch to disconnect domestic electrical supply from the Enemalta main electrical supply.

Required Knowledge	1. Understands the roles and responsibilities of themselves and others under the Health and Occupational Health and Safety Act 2000. 2. Knows the health and safety risks present in their role which include tools, materials and equipment used and working practices and procedures. 3. Recognises potential hazardous material in the workplace. 4. Understands the procedures for dealing with potential hazardous material in the place of work. 5. Understands health concerns associated with the workplace and safe practices when carrying out work. 6. Locates expert assistance when help is needed. 7. Knows when there is a hazard in the place of work (such as electricity, slippery and uneven surfaces, dust and fumes, handling and transporting, contaminants and irritants, fire, heights, improper use of tools and equipment). 8. Understands and explains how to safely use scaffold platforms (less than 2m). 9. Understands the importance of being alert to the presence of hazards in the place of work. 10. Knows the responsible persons to whom to report health and safety matters. 11. Knows the emergency procedures in the place of work. 12. Knows the first aid facilities that exist within the work area. 13. Understands the general risk assessments, method statements and how to apply them in the place of work. 14. Understands the use of barriers and warning signs. 15. Understands the necessary safety precautions including the use of protective clothing and equipment for a range of applications.

Required Knowledge	16. Knows and understands the methods used for protecting customers' property. 17. Identifies domestic electrical services isolating switch gear. 18. Knows and understand when it is required to isolate domestic electrical supply from the National Grid main supply.

Required Skills	1. Work according to health and safety regulations and other relevant regulations that might apply to particular working site. 2. Identify health and safety hazards associated with electricity at specific work site. 3. Inspect and identify possible defects in tools and equipment that could lead to unsafe working conditions. 4. Follow instructions to minimise and dispose waste in a safe and environmentally acceptable way. 5. Describe the permit-to-work and lock-off procedures; confirm that authorisation to carry out the installation activities has been given. 6. Describe the importance of wearing personal protective clothing and equipment during the installation at the various construction stages. 7. Carry out checks to ensure that hand tools, power tools and equipment are safe for use. 8. Take responsibility to warn others as instructed of the repair work being carried out. 9. Set up safety barriers around electrical hazards to protect working personnel and members of the public. 10. Check that safe access and working arrangements for the installation area have been provided. 11. Confirm that services have been safely isolated, ready for the installation (such as mechanical, electricity, gas, air or fluids). 12. Check that all required installation consumables are available.

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AEE: 202
Assist in the Electrical Installation Work

Description of Unit	This Occupational Standard is about the requirements for assisting in the installation of electrical/electronic equipment, in accordance with approved procedures.

Performance Criteria	The candidate must have the necessary knowledge and skills to: 1. Assist in the installation of various electrical power supplies, such as single phase, three-phase, direct current and low voltage. The installation will also include fitting and connecting a range of electrical components, such as switchgear and distribution panels, motors and starters, control systems, safety devices, luminaires, and wiring enclosures. 2. Use the appropriate tools and equipment throughout the installation, 3. Apply a range of installation methods and techniques to install various electrical components, wires, cables, enclosures and connectors that make up the electrical system/circuit. In addition, you will be expected to make electrical connections to sensors/activators and other devices, as appropriate to the equipment being installed, which could include mechanical, fluid power, water or fuel supplies. 4. Make checks and adjustments, in line with your permitted authority, and assisting others to ensure that the installed equipment functions to the required specification. 5. Comply with organisational policy and procedures for the installation activities undertaken, and to report any problems with the activities, tools or equipment used that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. 6. Check that all tools, equipment and materials used in the installation activities are removed from the work area on completion of the work, and that the necessary job/task documentation is completed accurately and legibly. 7. Work to instructions, alone or in conjunction with others, taking personal responsibility for your own actions, and for the quality and accuracy of the work that you carry out.

Performance Criteria	8. Demonstrate a significant personal contribution to the installation activities, in order to satisfy the requirements of the standard, and you must demonstrate competence in all the areas required by the standard.

Required Knowledge	1. The health and safety requirements of the area in which the installation activity is to take place, and the responsibility these requirements place on you. 2. The isolation and lock-off procedure or permit-to-work procedure that applies. 3. The specific health and safety precautions to be applied during the installation procedure, and their effects on others. 4. The hazards associated with installing electrical/electronic equipment, and with the tools and equipment used, and how to minimise them and reduce any risks. 5. The importance of wearing protective clothing and other appropriate safety equipment during the installation. 6. How to obtain and interpret information from job instructions and other documentation used in the installation activities (such as installation drawings, specifications, manufacturers' manuals, IEE regulations, symbols and terminology). 7. The basic principle of operation of the equipment/circuits being installed. 8. The different types of cabling used in the maintenance activities, and their methods of termination. 9. The care, handling and application of electrical measuring instruments (such as multimeter, resistance tester, earth-loop impedance tester).

Required Knowledge	10. Methods of lifting, handling and supporting the equipment during the installation activities. 11. How to check that components meet the required specification/operating conditions (such as values, tolerance, current carrying capacity, voltage rating, power rating, working temperature range). 12. The techniques used to terminate electrical equipment (such as plugs, soldering, screwed, clamped and crimped connections). 13. Methods of attaching markers/labels to components or cables, to assist with identification. 14. The tools and equipment used in the installation activities (such as cable stripping tools, crimping tools, soldering irons and torches, gland connecting tools). 15. How to make adjustments to components/assemblies to ensure that they function correctly. 16. The importance of making 'off-load' checks before proving the equipment with the electrical supply on. 17. Why electrical bonding is critical, and why it must be both mechanically and electrically secure. 18. The fault-finding techniques to be used if the equipment fails to operate correctly. 19. The recording documentation to be completed for the activities undertaken. 20. The extent of your own responsibility and to whom you should report if you have problems that you cannot resolve.

Required Skills	1. Explain the key hazards associated with installation. 2. Plan and prepare for work. 3. Carry out installation tasks from simplified instructions and simplified working documentation. 4. Identify and use appropriately power and hand tools and equipment for installation tasks. 5. Assist with the installation of electrical equipment and components. 6. Describe the basic principle of operation of the equipment and circuits being installed. 7. Identify the use and purpose of already installed cables during maintenance activities. 8. Carry out lifting, handling and supporting equipment in a safe manner. 9. Carry out the termination of electrical equipment to the required standard. 10. Carry out labelling to components and cables as instructed in wiring circuits drawings and installation documentation. 11. Describe and identify your responsibility as an assistant electrical fitter to report and give routine hand over to your supervisors. 12. Assist in carrying out the installation, positioning and securing of equipment using appropriate methods and techniques. 13. List the technical characteristics of various mechanical fasteners and their method of installation. 14. Carry out drilling and chasing tasks in an appropriate manner. 15. Carry out cleaning from dust and other dirt distribution boxes and all other termination points. 16. Change faulty plugs, fuses, starters, tubes and lamps in a safe manner. 17. Assist in the isolation of equipment and circuits from the electrical supply before starting repairs. 18. Connect cables correctly when changing plugs and fit plug fuses of the right rating. 19. Correctly replace starters, tubes and lamps of the correct rating with the electrical supply switch off.

Required Skills	20. Use different methods of communication to liaise with the building and installation team. 21. Select, use, clean and store hand tools and portable power tools. 22. Assist in setting out cable runs and installation of cables from simplified working drawings. 23. Fix electrical appliances to walls and ceilings of different materials. 24. Identify different conduit and trunking. 25. Demonstrate procedures for installing conduits and / or ducts. 26. Demonstrate procedures for connecting fixtures. 27. Terminate electrical conductors into accessories ready for inspection. 28. Identify the types of single phase circuits used in residential dwelling installation. 29. Identify residential single phase distribution boards with a double pole isolating switch. 30. Identify the various types of floor, wall and ceiling construction methods and materials. 31. Carry out the safe erection, use and dismantling of simple system scaffold platforms less than 2m high. 32. Inspect and identify any visual mechanical damage to an electrical isolation switch. 33. Locate and manually operate the isolation switch to disconnect a residential single phase installation or circuit from the electrical supply. 34. Identify low voltage and 240V cables from given specifications. 35. Demonstrate knowledge of earthing. 36. Demonstrate knowledge of circuit protection.

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AEE: 201
Assist in the Maintenance of Electrical Installations and Equipment

Description of Unit	This Occupational Standard is about the requirements for assisting in the maintenance of electrical/electronic equipment, in accordance with approved procedures.

Performance Criteria	The candidate must have the necessary knowledge and skills to: 1. Assist in the maintenance of various equipment of the electrical power supplies installations. 2. Use the appropriate tools and equipment throughout the maintenance process. 3. Make checks and adjustments, in line with your permitted authority, and assisting others to ensure that the installed equipment functions to the required specification. 4. Comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems with the activities, tools or equipment used that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. 5. Check that all tools, equipment and materials used in the maintenance activities are removed from the work area on completion of the work, and that the necessary job/task documentation is completed accurately and legibly. 6. Work to instructions, alone or in conjunction with others, taking personal responsibility for your own actions, and for the quality and accuracy of the work that you carry out. 7. Demonstrate a significant personal contribution to the maintenance activities, in order to satisfy the requirements of the standard.

Required Knowledge	1. The key hazards associated with maintenance. 2. The types of maintenance. 3. The distinction between preventive and corrective maintenance. 4. How to check that tools and equipment are free from damage or defects, and are in a safe and usable condition. 5. How to identify faulty parts and / or equipment. 6. The calibration/care and control procedures for tools and equipment. 7. The problems that can occur with the installation operations, and how these can be overcome.

Required Skills	1. Explain the key hazards associated with maintenance. 2. Identify the types of maintenance. 3. Distinguish between preventive and corrective maintenance. 4. Identify faulty parts and / or equipment. 5. List the tools for required troubleshooting. 6. List the basic measurements tests. 7. Replace or repair faulty / worn out or damaged parts. 8. Keep in good order the tools used for the installation and maintenance of domestic electrical systems.

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AEE: 201
Assists in the Testing of Electrical Installations and Equipment and in the Required Documentation

Description of Unit	This Unit is about procedures and testing techniques of Electrical installations and equipment and also about documentation required.

Performance Criteria	The candidate must have the appropriate knowledge and skills to: 1. Assist in the testing of electrical installations and the equipment installed. 2. Use the appropriate instruments and tools throughout the testing process. 3. See that instruments used are properly calibrated. 4. Make checks and adjustments, in line with your permitted authority, and assisting others to ensure that the installed equipment functions to the required specification. 5. Comply with organisational policy and procedures for the testing and documentation procedures undertaken, and to report any problems with the activities, instruments, tools or equipment used that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. 6. Check that all instruments, tools, equipment and materials used in the maintenance activities are removed from the work area on completion of the work, and that the necessary job/task documentation is completed accurately and legibly. 7. Work to instructions, alone or in conjunction with others, taking personal responsibility for your own actions, and for the quality and accuracy of the work that you carry out.

Required Knowledge	1. The key hazards associated with testing. 2. The different tests; and the testing instruments used and their handling. 3. How to make adjustments to components/assemblies to ensure that they function correctly. 4. The importance of making `off-load' checks before proving the equipment with the electrical supply on. 5. Why electrical bonding is critical, and why it must be both mechanically and electrically secure. 6. The fault-finding techniques to be used if the equipment fails to operate correctly. 7. The recording documentation to be completed for the activities undertaken. 8. The extent of your own responsibility and to whom you should report if you have problems that you cannot resolve.

Required Skills	1. Explain the key hazards associated with testing. 2. Follow instructions to assist in installation checks. 3. Assist in installation and checks before switching on supply on load. 4. Identify and follow instructions to send equipment for calibration routinely or when mishandled. 5. List simple fault-finding techniques. 6. State the reason for short circuit.

	7. Explain the reason for leakage current. 8. Assist in carrying out operational testing. 9. Assist in compiling as fitted documentation. 10. Obtain and interpret simplified job instructions from working installation drawings and related working documentation until it is clear what to do. 11. List the documents associated with completed works. 12. Explain the purpose of final quality inspection.