NATIONAL QUALIFICATION

15UY0241-4

ELECTRICIAN LEVEL 4

REVISION NO: 00
AMENDMENT NO: 01

VOCATIONAL QUALIFICATIONS AUTHORITY

Ankara, 2015

PREFACE

Electrician (Level 4) National Qualification has been developed in accordance with the provisions of the “Regulation on the Development of National Occupational Standards and National Qualifications” issued pursuant to the Vocational Qualifications Authority (VQA) Law No. 5544.

The qualification template has been prepared by the Confederation of Turkish Tradesmen and Craftsmen (TESK) assigned by the cooperation protocol signed on 04.07.2014. The opinions of the relevant institutions and organizations in the sector were taken about the template prepared, and the necessary regulations on the template were made by assessing those opinions. After the final template was analyzed and assessed by the VQA’s Electric and Electronic Committee and approved by the Committee, it entered into force upon being approved by the VQA's Executive Board as per the Decision No. 2015/67 and dated 19/12/2015.

Electrician (Level 4) National Qualification has been amended by the Presidential Decree dated 10.06.2020 and no. 1570.

We would like to extend our gratitude to people, institutions, and organizations, which presented their opinions and contributed to the development, review, and verification of the qualification, for their contributions and opinions, and we submit the qualification for all parties' information who may benefit from it.

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INTRODUCTION

The key criteria for the development of national qualification, its review by the relevant sector committees and its approval by the VQA's Executive Board are established in the "Regulation on the Development of National Occupational Standards and National Qualifications".

The basic criteria for national qualifications are defined as follows:

a) National qualifications shall be developed on the basis of national occupational standards or international standards.
b) National qualifications shall be developed with a participatory approach and the opinions and contributions of relevant parties shall be received.
c) National qualifications cover matters related to occupational health and safety, environmental safety and quality, regarding the occupational field.
d) National qualifications shall be written to be understood by users.
e) National qualifications encourage individuals to develop themselves and make progress in the occupation, within the framework of the lifelong learning principle.
f) National qualifications do not contain any discriminative components, either explicit or implicit.
g) National qualifications include components that ensure measuring the knowledge, skills, and competency of individuals within the scope of quality assurance.

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15UY0241-4 ELECTRICIAN (LEVEL 4) NATIONAL QUALIFICATION

1	**NAME OF THE QUALIFICATION UNIT**	Electrician
2	**REFERENCE CODE**	15UY0241-4
3	**LEVEL**	4
4	**PLACE IN THE INTERNATIONAL CLASSIFICATION**	ISCO 08: 3113 (Electrical engineering technicians)
5	**TYPE**	-
6	**CREDIT VALUE**	-
7	**A) PUBLICATION DATE**	-
	B) REVISION / AMENDMENT NO	Revision No: 00 Amendment No: 01
	C) REVISION / AMENDMENT DATE	Amendment No. 01 10/06/2020-1570
8	**AIM**	The purpose of this national qualification is to provide the following in the occupation of Electrician (Level 4); • Defining the qualifications, knowledge, skills, and competencies that the candidates should possess, • Enabling candidates to prove their vocational qualification with a valid and reliable certificate, • Presenting a reference and resource for the education system, testing and awarding bodies.
9	**THE OCCUPATIONAL STANDARD(S) BASIS FOR THE QUALIFICATION UNIT**	
14UMS0399-4 Electrician (Level 4) National Occupational Standard		
10	**REQUIREMENT(S) FOR ENTERING THE QUALIFICATION EXAM**	
-		
11	**STRUCTURE OF QUALIFICATION**	
11-a) Mandatory Units		
15UY0241-4/A1: Occupational Health and Safety, Environmental Protection and Work Organization		
11-b) Elective Units		
15UY0241-4/B1: Electrical Interior Installation Project Preparation 15UY0241-4/B2: Electrical Interior Installation Application		
11-c) Alternatives for Grouping Units and Additional Learning Outcomes		
Alternative-1: A1 and B1 Alternative-2: A1 and B2 Alternative-3: A1 and B1, B2		

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12	ASSESSMENT AND EVALUATION	
Candidates willing to achieve the Electrician (Level 4) Vocational Qualification Certificate are subjected to the exams defined in the units. In order for the candidates to achieve their vocational qualification certificates, they must succeed in the exams defined in the units. Theoretical and practical exams in the qualification units can be held separately or jointly for each unit. However, each unit must be assessed independently. The validity period of qualification units is 2 years from the date of achievement of the unit. In order to achieve a qualification by combining the qualification units, all units must remain valid.		
13	**VALIDITY PERIOD OF THE CERTIFICATE**	The validity period of the certificate is five (5) years.
14	**OBSERVANCE FREQUENCY**	-
15	**ASSESSMENT AND EVALUATION METHOD TO BE USED IN CERTIFICATE RENEWAL**	At the end of the validity period of five (5) years, the performance of the certificate holder shall be assessed using at least one of the methods defined below; a) Submitting records indicating that they worked in the relevant field for at least two years in total or for the last six months within the 5-year document validity period (such as service transcript, reference letter, contract, invoice, portfolio), b) Taking the practical exams defined for the qualification units within the scope of qualification. For the candidates with a positive assessment result, the validity period of the certificate shall be extended for another 5 years.
16	**ORGANIZATION(S) DEVELOPING THE QUALIFICATION**	Confederation of Turkish Tradesmen and Craftsmen (TESK)
17	**SECTOR COMMITTEE THAT VERIFIED THE QUALIFICATION SECTOR COMMITTEE**	VQA Electric and Electronics Sector Committee
18	**VQA EXECUTIVE BOARD'S APPROVAL DATE and NUMBER**	19/12/2015 - 2015/67

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15UY0241-4/A1: OCCUPATIONAL HEALTH AND SAFETY, ENVIRONMENTAL PROTECTION AND WORK PROCESS ORGANIZATION QUALIFICATION UNIT

1	**NAME OF THE QUALIFICATION UNIT**	Occupational Health and Safety, Environmental Protection and Work Process Organization
2	**REFERENCE CODE**	15UY0241-4/A1
3	**LEVEL**	4
4	**CREDIT VALUE**	-
5	**A) PUBLICATION DATE**	-
	B) REVISION / AMENDMENT NO	Revision No: 00 Amendment No: 01
	C) REVISION / AMENDMENT DATE	Amendment No. 01 10/06/2020-1570
6	**THE OCCUPATIONAL STANDARD BASIS FOR THE QUALIFICATION UNIT**	
14UMS0399-4 Electrician (Level 4) National Occupational Standard		
7	**LEARNING OUTCOMES**	

Learning Outcome 1: Explains OHS and environmental protection risks and measures within work processes.

Performance Criteria:

1.1. Explains the OHS procedures and measures related to potential hazards, sources of hazards and risks in work processes.

1.2. Explains the environmental protection applications in the work environment.

Learning Outcome 2: Determines the appropriate organization and preparation activities for the work processes.

Performance Criteria:

2.1. Describes process regulation and record keeping in the work environment.

2.2. Describes the processes for keeping equipment, devices and tools functional.

2.3. Determines the preparations for materials, equipment, devices and tools according to the project.

8	**ASSESSMENT AND EVALUATION**

8 a) Theoretical Exam

(T1): The theoretical exam for the A1 unit shall be applied as per the "Information" checklist in Annex A1-2. In the theoretical exam, candidates should take a written exam (T1) consisting of at least thirty (30) four-option multiple-choice questions, each one with an equal point value. No points shall be deducted for wrong answers in the exam consisting of multiple-choice questions. Candidates are given an average time of 2 minutes per question during the exam. The candidate who answers at least 80% of the questions correctly in the exam is considered successful. The questions in the exam should measure all knowledge statements (ANNEX A1-2) intended to be measured by the theoretical exam in this unit.

8 b) Practical Exam

The expressions of skill and competency for this unit are defined in the skills and competencies checklists of other units and, in this context, the mentioned expressions of skill and competency will be assessed and evaluated.

8 c) Other Conditions Regarding Assessment and Evaluation

The validity period of the qualification unit is 2 years from the date of achievement of the unit.

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9	**INSTITUTION/ORGANIZATION(S) DEVELOPING THE QUALIFICATIONS UNIT**	TESK (Confederation of Turkish Tradesmen and Craftsmen)
10	**SECTOR COMMITTEE CONFIRMING SECTOR COMMITTEE**	VQA Electric and Electronics Sector Committee
11	**VQA EXECUTIVE BOARD'S APPROVAL DATE and NUMBER**	19/12/2015 - 2015/67

QUALIFICATION UNIT ANNEXES

ANNEX [A1]-1: Information on the Recommended Training for the Acquisition of the Qualification Unit

1. Team management
2. Environmental protection in electrical installation application areas
3. Devices, tools and instruments used in electrical installation application processes
4. Organization in electrical installation application processes
5. Occupational health and safety during the electrical installation application processes and in the work areas
6. Legislation and standards related to electrical installation applications
7. Materials in electrical installation applications
8. Fundamental labor legislation
9. Basic document preparation
10. Basic quality

ANNEX [A1]-2: Checklist to be Used in the Assessment and Evaluation of the Qualification Unit

a) INFORMATION

No.	Knowledge Statement	National Occupational Standards Related Section	Qualification Unit Performance Criteria	Assessment Tool
INFO.1	Distinguishes between the terms hazard, source of hazard and risk semantically.	A.1.1-3	1.1	T1
INFO.2	Explains the hazards and risks in electrical installation construction processes according to the works and conditions.	A.1.1	1.1	T1
INFO.3	Explains the appropriate precautions according to the possible OHS risks and hazards in the installation processes.	A.1.1	1.1	T1
INFO.4	Explain the PPE specific to the jobs and their risks.	A.2.1-2	1.1	T1
INFO.5	Distinguishes the precautions appropriate for the working conditions in high, dusty, wet ground, dark, medium voltage, flammable and explosive environments.	A.3.1-3	1.1	T1
INFO.6	Explains the safety features of the equipment and materials used.	A.3.1-3	1.1	T1
INFO.7	Explains the scope of the emergency.	A.4.1-3	1.1	T1
No.	**Knowledge Statement**	**National Occupational**	**Qualification Unit**	**Assessment Tool**

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		Standards Related Section	Performance Criteria	
INFO.8	Explains the content and justifications of emergency plans.	A.4.1-3	1.1	T1
INFO.9	Distinguishes proper actions and measures for emergency cases.	A.4.1-3	1.1	T1

No.	Knowledge Statement	National Occupational Standards Related Section	Qualification Unit Performance Criteria:	Assessment Tool
INFO.10	Explains the procedures to be applied in case of an occupational accident.	A.4.1-3	1.1	T1
INFO.11	Describes the basic first aid rules about electrical accidents.	A.4.1-3	1.1	T1
INFO.12	Distinguishes environmental protection risks in environments where occupational activities take place.	A.5.1-2, A.6.1-2	1.2	T1
INFO.13	Explains the recycling and disposal rules of wastes generated from electrical installations.	A.5.1-2, A.6.1-2	1.2	T1
INFO.14	Explains the structural construction properties of the floors and walls of the buildings in terms of electrical installation infrastructure.	C.1.1-3, C.2.1-2	2.1	T1
INFO.15	Relates electrical installation construction processes and construction phases.	C.1.1-3, C.2.1-2	2.1	T1
INFO.16	Explains the permit and approval procedures for electrical installations in construction.	C.1.1-3, C.2.1-2	2.1	T1
INFO.17	Determines the team requirement and team organization flow in electrical installation construction tasks, according to the scope of the construction project.	C.2.3	2.1	T1
INFO.18	Explains the content and function of reports, records and forms according to the features and stages of electrical installation tasks.	B.1.3, C.3.1-3, F.1.8, G.3.4	2.1	T1
INFO.19	Explains the technological features of the equipment, devices and tools used.	C.4.1-3	2.2	T1
INFO.20	Explains the procedures related to the maintenance practices of the equipment, devices and tools used, according to relevant technical instructions.	C.4.1-3	2.2	T1
INFO.21	Lists the needs for cables, pipes, accessories, assembly materials, etc. in separate items according to the project.	E.1.1-2	2.3	T1
INFO.22	Determines the technical features of the materials and their compliance with the project and legal standards in terms of quantity.	E.1.1-2	2.3	T1
INFO.23	Determines the equipment, devices and tools to be used in the installation process according to the application stages.	E.2.1	2.3	T1

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QUALIFICATION UNIT

1	**NAME OF THE QUALIFICATION UNIT**	Electrical Interior Installation Project Preparation
2	**REFERENCE CODE**	15UY0241-4/B1
3	**LEVEL**	4
4	**CREDIT VALUE**	-
5	**A) PUBLICATION DATE**	-
	B) REVISION / AMENDMENT NO	Revision No: 00 Amendment No: 01
	C) REVISION / AMENDMENT DATE	Amendment No. 01 10/06/2020-1570
6	**THE OCCUPATIONAL STANDARD BASIS FOR THE QUALIFICATION UNIT**	
14UMS0399-4 Electrician (Level 4) National Occupational Standard		
7	**LEARNING OUTCOMES**	

Learning Outcome 1: Reads the electrical interior installation project in the professional context.

Performance Criteria:

1.1. Defines the basic units and values and symbols related to the installation projects.

1.2. Reads and explains the electrical project in accordance with the relevant rules.

Learning Outcome 2: Prepares electrical interior installation project(s) in accordance with the legal scope.

Performance Criteria:

2.1. Assesses installation needs in accordance with identified needs and legal professional scope.

2.2. Prepares electrical interior installation project according to the evaluations made.

Learning Outcome 5: Follows the OHS and environment requirements.

Performance Criteria:

5.1 : Follows the OHS rules in the works carried out.

5.2 : Considers the environmental effects and quality of the works performed.

8	**ASSESSMENT AND EVALUATION**

8 a) Theoretical Exam

(T1): The theoretical exam for the B1 unit shall be applied as per the "Information" checklist in Annex B1-2. In the theoretical exam, candidates should take a written exam (T1) consisting of at least fifteen (15) four-option multiple-choice questions, each one with an equal point value. No points shall be deducted for wrong answers in the exam consisting of multiple-choice questions. Candidates are given an average time of 2 minutes per question during the exam. A candidate who answers at least 80% of the questions correctly in the written exam shall be deemed successful. The questions in the exam should measure all knowledge statements (Annex B1-2) intended to be measured by the theoretical exam in this unit.

8 b) Practical Exam

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(P1): The practical exam for the B1 unit is applied as per the "Skills and Competencies" checklist given in Annex B1-2. The critical steps that must be accomplished by the candidate shall be specified in the skills and competencies checklist. In order for a candidate to succeed in the practical exam, they should score at least 80 out of 100 points (80%) in the overall exam, provided that they succeed in all the critical steps. The duration of the practical exam should correspond to the period in actual practice conditions within the specified scope. The practical exam shall be carried out in a real or realistically arranged project preparation environment. All expressions of skill and competency (Annex B1-2) should be measured with a practical exam.

8 c) Other Conditions Regarding Assessment and Evaluation

The validity period of the exams foreseen for the unit shall be 1 year from the date of achievement of the exam. In order to achieve the unit, the time between achieved exam dates cannot exceed one year. The validity period of the qualification unit is 2 years from the date of achievement of the unit.

If the candidate displays behavior that could jeopardize their own safety and the safety of others, the exam shall be terminated.

9	**INSTITUTION/ORGANIZATION(S) DEVELOPING THE QUALIFICATIONS UNIT**	Confederation Of Turkish Tradesmen And Craftsmen (TESK)
10	**SECTOR COMMITTEE CONFIRMING SECTOR COMMITTEE**	VQA Electric and Electronics Sector Committee
11	**VQA EXECUTIVE BOARD'S APPROVAL DATE and NUMBER**	19/12/2015 - 2015/67

QUALIFICATION UNIT ANNEXES

ANNEX [B1]-1: Information on Recommended Education for Acquisition of a Qualification Unit

1. Electrical interior installation equipment and materials
2. Electrical interior installation calculations
3. Electrical interior installation project design
4. Electrical interior installation standards
5. Basic construction
6. Legislation on building inspection and permit procedures and electrical works

ANNEX B1-2: Checklist to be Used in the Assessment and Evaluation of the Qualification Unit

a) INFORMATION

No.	Knowledge Statement	National Occupational Standards Related Section	Qualification Unit Performance Criteria	Assessment Tool
INFO.1	Defines the basic units and electrical values (watt, kilowatt, ampere, cross-section, ohm etc.) related to the installation projects.	D.1.1-3	1.1	T1
INFO.2	Defines the meanings of symbols (switch, counter, socket, and similar elements etc.) used in installation projects.	D.1.1-3	1.1	T1
INFO.3	Defines the location and direction of the project relative to the site.	D.1.1-4	1.2	T1
INFO.4	Distinguishes weak current and strong current installations.	D.1.1-4	1.2	T1

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No.	Knowledge Statement	National Occupational Standards Related Section	Qualification Unit Performance Criteria	Assessment Tool
INFO.5	Explains conductor cross-sections, current values and materials to be used.	D.1.1-4	1.2	T1
INFO.6	Explains the architecture of the project.	D.1.1-4	1.2	T1
INFO.7	Explains the standards and regulations related to interior installation project designs.	D.2.1-2	2.1	T1
INFO.8	Determines the electrical usage needs of the architectural project, the building units and the physical characteristics of the building (structural, situational etc.) related to the project to be prepared.	D.2.1-2	2.1	T1
INFO.9	Determines the locations of lines, sockets, switches, junction boxes etc. in the project according to the needs and building characteristics.	D.2.1-2	2.1	T1
INFO.10	Determines the scaling value according to the architectural project and measurements.	D.2.1-2	2.1	T1

b) SKILLS AND COMPETENCIES

No	Statement of Skills and Competencies	National Occupational Standards Related Section	Qualification Unit Performance Criteria:	Assessment Tool
* SC.1	Conducts the relevant calculations (power, lighting, grounding, cross-section, current control, voltage drop, compensation, lightning rod etc.) specified in the Electrical Installation Project Regulation.	A.3.3, D.2.3	2.2	P1
* SC.2	Prepares detailed drawings of the installation according to the architecture manually or in a digital environment in accordance with the relevant electrical regulations.	A.3.3, D.2.4	2.2	P1
SC.3	Creates tables and charts for the drawings and calculations prepared.	D.2.5	2.2	P1
SC.4	Produces the materials list of the installation according to the drawn project scope.	A.3.3, E.1.1	2.2	P1
*SC.5	Wears work clothing and personal protective equipment suitable for the job.	A.1.2	5.1	P1
*SC.6	Places the warning signs and plates of the performed work in accordance with the instructions.	A.1.4	5.1	P1
*SC.7	Ensures temporary storage of dangerous and hazardous wastes by taking the necessary measures.	B.2.2	5.2	P1
*SC.8	Applies the quality requirements according to the instructions and plans in the operation forms.	C.1.1	5.2	P1
*SC.9	Applies the quality requirements according to the tolerances and deviations allowed in the application.	C.1.2	5.2	P1

(*) Critical steps that must be accomplished in the practical exam.

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15UY0241-4/B2: ELECTRICAL INTERIOR INSTALLATION APPLICATION QUALIFICATION UNIT

1	**NAME OF THE QUALIFICATION UNIT**	Electrical Interior Installation Application
2	**REFERENCE CODE**	15UY0241-4/B2
3	**LEVEL**	4
4	**CREDIT VALUE**	-
5	**A) PUBLICATION DATE**	-
	B) REVISION / AMENDMENT NO	Revision No: 00 Amendment No: 01
	C) REVISION / AMENDMENT DATE	Amendment No. 01 10/06/2020-1570
6	**THE OCCUPATIONAL STANDARD BASIS FOR THE QUALIFICATION UNIT**	
14UMS0399-4 Electrician (Level 4) National Occupational Standard		
7	**LEARNING OUTCOMES**	

Learning Outcome 1: Performs the operations related to arranging the work environment for electrical installation construction processes in accordance with the rules.

Performance Criteria:

1.1. Makes the necessary preparations for the environment where installation will take place in accordance with the technical and safety-related requirements.
1.2. Takes measures to ensure personal safety.
1.3. Performs grounding tasks in accordance with the project.

Learning Outcome 2: Prepares the electrical infrastructure of the installation.

Performance Criteria:

2.1. Reads and explains the electrical installation project in accordance with the relevant rules.
2.2. Explains the features and dimensions of the electrical infrastructure of the tools and equipment of the installation.
2.3. Prepares the electrical infrastructure of the installation according to the project, construction processes and legal rules.

Learning Outcome 3: Creates the installation lines in accordance with the project.

Performance Criteria:

3.1. Performs operations regarding cable assembly and junction box connection in accordance with relevant technique.
3.2. Sets up measurement and distribution panels according to the relevant methods.
3.3. Establishes the lightning rod installation in accordance with the relevant standards.
3.4. Assembles the structure inlet line of the installation in accordance with the relevant method.
3.5. Mounts the equipment and accessories of the installation in accordance with their relevant techniques.

Learning Outcome 4: Performs the operations to ensure the functionality and quality of the laid installation according to relevant methods.

Performance Criteria:

4.1. Energizes the completed installation in accordance with the relevant procedure.
4.2. Performs quality and operation tests and measurements of installation and grounding in accordance with legal rules and techniques.

Learning Outcome 5: Performs the inspection and dismantling operations of the completed installation in accordance with relevant method.

Performance Criteria:

5.1. Determines the functionality of the installation and its maintenance and repair requirements.
5.2. Disassembles the installation according to the relevant method and within the defined scope.

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Learning Outcome 6: Follows the OHS and environment requirements.

Performance Criteria:

6.1 : Follows the OHS rules in the works carried out.

6.2 : Considers the environmental effects and quality of the works performed.

8	ASSESSMENT AND EVALUATION

8 a) Theoretical Exam

(T1): The theoretical exam for the B2 qualification unit shall be applied as per the "Information" checklist in Annex B2-2. In the theoretical exam, candidates should take a written exam (T1) consisting of at least twenty-five (25) four-option multiple-choice questions, each one with an equal point value. No points shall be deducted for wrong answers in the exam consisting of multiple-choice questions. Candidates are given an average time of 2 minutes per question during the exam. A candidate who answers at least 80% of the questions correctly in the written exam shall be deemed successful. The questions in the exam should measure all knowledge statements (Annex B2-2) intended to be measured by the theoretical exam in this unit.

8 b) Practical Exam

(P1): The practical exam for B2 unit is realized as per the "Skills and Competencies" checklist given in Annex B2-2. The critical steps that must be accomplished by the candidate shall be specified in the skills and competencies checklist. In order for a candidate to succeed in the practical exam, they should score at least 90 out of 100 points (90%) provided that they succeed in all the critical steps. The duration of the practical exam should correspond to the period in actual practice conditions within the specified scope. The practical exam shall be carried out in a real or realistically arranged work environment. All skill and competency statements (Annex B2-2) should be assessed through a practical exam.

8 c) Other Conditions Regarding Assessment and Evaluation

The candidate should pass T1 and P1 exams in order to be considered successful in the mentioned unit. The validity period of the qualification unit is 2 years from the date of achievement of the unit.

If the candidate displays a behavior that could jeopardize their own safety and the health and safety of others, the exam shall be terminated.

9	**INSTITUTION/ORGANIZATION(S) DEVELOPING THE QUALIFICATIONS UNIT**	Confederation Of Turkish Tradesmen And Craftsmen (TESK)
10	**SECTOR COMMITTEE CONFIRMING SECTOR COMMITTEE**	VQA Electric and Electronics Sector Committee
11	**VQA EXECUTIVE BOARD'S APPROVAL DATE and NUMBER**	19/12/2015 - 2015/67

QUALIFICATION UNIT ANNEXES

ANNEX [B2]-1: Information on Recommended Training for Acquisition of the Qualification Unit

1. Electrical interior installation construction (project implementation)
2. Electrical interior installation dismantling
3. Electrical interior installation construction and material standards
4. Preparing the building electrical interior installation infrastructure
5. Building electrical interior installation approval and inspection procedures
6. Grounding and lightning rod facility preparation

ANNEX [B2]-2: Checklist to be Used in the Assessment and Evaluation of the Qualification Unit

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a) INFORMATION

No.	Knowledge Statement	National Occupational Standards Related Section	Qualification Unit Performance Criteria	Assessment Tool
INFO.1	Determines the equipment, devices and tools to be used in the installation task according to the application stages.	A.3.3, E.1.3, E.2.1-2, E.3.1-3, E.4.1-3, G.4.5	1.1	T1
INFO.2	Distinguishes suitable cables according to power and distance to energize the construction site.	A.3.3, E.1.3, E.2.1-2, E.3.1-3, E.4.1-3, G.4.5	1.1	T1
INFO.3	Explains the maintenance and troubleshooting practices of the equipment, devices and tools used according to their technical instructions.	A.3.3, E.1.3, E.2.1-2, E.3.1-3, E.4.1-3, G.4.5	1.1	T1
INFO.4	Defines the basic units and electrical values (watt, kilowatt, ampere, cross-section, ohm, etc.) related to the installation projects.	D.1.1-3	2.1	T1
INFO.5	Defines the meanings of symbols (switch, counter, socket, and similar elements etc.) used in installation projects.	D.1.1-3	2.1	T1
INFO.6	Describes the location and direction of the installation project relative to the site.	D.1.1-4	2.1	T1
INFO.7	Distinguishes weak current and strong current installations.	D.1.1-4	2.1	T1
INFO.8	Explains conductor cross-sections, current values and materials to be used.	D.1.1-4	2.1	T1
INFO.9	Explains the architecture of the project.	D.1.1-4	2.1	T1
INFO.10	Distinguishes the pipes to be used according to the cross-sections and number of cables.	F.2.1-3	2.2	T1
INFO.11	Explains the correct placement dimensions of switches, socket frames and junction boxes according to the construction legislation of Electrical Interior Installations.	F.3.1-2	2.2	T1
INFO.12	Distinguishes switch types according to their functions.	F.3.1-2	2.2	T1
INFO.13	Distinguishes the cable ducts suitable for the cross-sections and the current of the cables.	F.4.1-3	2.2	T1
INFO.14	Distinguishes the types of terminal boxes according to the cross-sections and numbers of the cables.	F.6.1-3	3.1.	T1
INFO.15	Determines the technical specifications of the measurement and distribution panels according to the needs of the project and the rules determined by the legislation.	F.7.1	3.2.	T1

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No.	Knowledge Statement	National Occupational Standards Related Section	Qualification Unit Performance Criteria	Assessment Tool
INFO.16	Explains the effects and risks of loose connection problems in building inlet (main column) line connections.	F.9.1-2	3.4.	T1
INFO.17	Explains the technical features of measuring devices and instruments.	B.2.1-3, F.1.8, G.2.1-3, G.3.1-3	4.2.	T1
INFO.18	Distinguishes the usage and locations of measuring devices and instruments.	B.2.1-3, F.1.8, G.2.1-3, G.3.1-3	4.2.	T1
INFO.19	Distinguishes possible installation problems according to the nonconformities displayed in terms of measurement values.	B.2.1-3, F.1.8, G.2.1-3, G.3.1-3	4.2.	T1
INFO.20	Describes the function of stray current relay.	B.2.1-3, F.1.8, G.2.1-3, G.3.1-3	4.2.	T1
INFO.21	Explains the function of and the measurement methods for the compensation system in the installation.	G.4.1-5	5.1.	T1

b) SKILLS AND COMPETENCIES

No.	Statement of Skills and Competencies	National Occupational Standards Related Section	Qualification Unit Performance Criteria	Assessment Tool
SC.1	Examines the working environment according to work and safety and determines suitable places for spatial arrangements to be made.	A.1.1-3, A.3.1-2, E.1.3, E.2.1-2, E.3.1-3	1.1	P1
* BY.2	Makes arrangements appropriate for work and safety, such as scaffolding and setting up ladders in designated places.	A.1.1-3, A.3.1-2, E.1.3, E.2.1-2, E.3.1-3, E.4.1-3	1.1	P1
SC.3	Selects materials and equipment in line with safety requirements.	A.3.3	1.1	P1
SC.4	Places the materials and equipment in the area in accordance with the work order.	E.1.3, E.2.1-2, E.3.1-3, E.4.1-3, G.4.5	1.1	P1
SC.5	Provides electricity to the construction site in accordance with the safety and technical rules of the work area.	A.1.1-3, A.3.1-3, E.1.3, E.2.1-2, E.3.1-3, E.4.1-3, G.4.5	1.1	P1
* SC.6	Cuts off the power before works in the work area.	A.2.1-2, A.3.1-2, A.4.3	1.1	P1

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No.	Statement of Skills and Competencies	National Occupational Standards Related Section	Qualification Unit Performance Criteria	Assessment Tool
* SC.7	Wears PPE suitable for the tasks during the work process.	A.2.1-2, A.3.2	1.2	P1
* SC.8	Selects and places warning, caution and prohibition signs suitable for the work area.	A.2.1-2, A.3.1-2	1.2	P1
SC.9*	Installs / places and uses the safety equipment in the work area, suitable for the characteristics and risks of the work area (high, dusty, wet ground, dark, medium and high voltage, flammable and explosive environments) in line with the work processes in the	A.3.1-3	1.2	P1
*SC.10	Determines the place (by measuring when necessary) in accordance with the Project and / or the Grounding Regulation.	B.1.2-4, F.1.1-8, G.4.5	1.3	P1
*SC.11	Establishes grounding and potential compensation installations in accordance with the project.	F.1.1-8, G.4.5	1.3	P1
*SC.12	Places the steel strip of which dimensions are determined in the relevant legislation into the foundation concrete according to the ground and floor characteristics.	F.1.1-8, G.4.5	1.3	P1
SC.13	Installs potential compensation busbar.	F.1.1-8, G.4.5	1.3	P1
*SC.14	Makes all the connections related to the grounding installation.	F.1.1-8, G.4.5	1.3	P1
*SC.15	Checks the conformity of grounding connections manually and visually.	B.1.2-4, B.2.1-3, F.1.1-8, G.4.5	1.3	P1
SC.16	Takes the protection measures (painting, coating the joint sections etc.) for the grounding elements against corrosion.	F.1.1-8, G.4.5	1.3	P1
SC.17	Conducts the resistance measurements of the grounding installation and determines its conformity to the Project.	B.1.2-4, B.2.1-3, F.1.1-8, G.4.5	1.3	P1
SC.18	Prepares the pipes in which the cables will be laid in the area in accordance with the relevant method.	B.1.2-4, F.2.1-3, G.4.5	2.3	P1
SC.19	Places the frames and junction boxes in the correct size and scale in accordance with the project and relevant standards.	B.1.2-4, B.2.1-3, F.3.1-2, G.4.5	2.3	P1
SC.20	Determines the cable duct routes in accordance with the project.	F.4.1, G.4.5	2.3	P1
SC.21	Places and fixes the cable ducts by using the appropriate equipment, materials and accessories on the routes determined.	F.4.2, G.4.5	2.3	P1

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No.	Statement of Skills and Competencies	National Occupational Standards Related Section	Qualification Unit Performance Criteria	Assessment Tool
SC.22	Installs the bus-bar system on the appropriate route according to the project.	F.4.3, G.4.5	2.3	P1
SC.23	Determines by using the guide whether the pipes or ducts in which the cables will be laid are blocked and eliminates blockages.	F.5.1, G.4.5	3.1	P1
*SC.24	Conducts the color-coding of the cables to be laid according to the project and legislation.	B.1.2-4, B.2.1-3, F.5.2, G.4.5	3.1	P1
SC.25	Lays the cables by using the guide in the pipes in accordance with the coding in concealed mounted cable laying practices.	F.5.3, G.4.5	3.1	P1
SC.26	Lays the cables in the cable ducts in accordance with the coding in surface mounted cable laying practices.	F.5.4, G.4.5	3.1	P1
*SC.27	Determines the correct connections of the laid cables in the junction box so that the installation can work.	B.1.2-4, F.6.1, G.4.5	3.1	P1
*SC.28	Connects the cables that need to be connected to each other at the junction box via appropriate terminal boxes.	F.6.2, G.4.5	3.1	P1
SC.29	Closes the junction box when the connections are complete.	F.6.3, G.4.5	3.1	P1
*SC.30	Mounts the panel to the appropriate place defined in the project in accordance with its method.	F.7.2, G.4.5	3.2	P1
*SC.31	Mounts the measuring materials, and protection and breaker components of the panel.	F.7.3, G.4.5	3.2	P1
*SC.32	Makes the connections of the assembled panels and cables in accordance with the project.	F.7.4, G.4.5	3.2	P1
SC.33	Prepares the place where the lightning rod assembly will be installed according to the project.	F.8.1, G.4.5	3.3	P1
SC.34	Installs lightning rod equipment and materials in accordance with the project.	F.8.2, G.4.5	3.3	P1
SC.35	Determines the route and conditions of the building inlet line to be laid in order to transfer energy from the main column line to the application area, according to the location of the main line and the project.	B.1.2-4, B.2.1-3, F.9.1, G.4.5	3.4	P1
SC.36	Sets up the line (before connection) from the air and/or ground, in accordance with the legislation, according to the determined route and cable cross-section.	F.9.2, G.4.5	3.4	P1
*SC.37	Selects the right material for the right place according to the project among the installation construction materials.	A.3.3, F.10.1, G.4.5	3.5	P1
*SC.38	Installs the correct materials, devices and accessories in their appropriate places.	F.10.2, G.4.5	3.5	P1
*SC.39	Makes the installation connections of the engine and devices correctly according to the technical instructions and legislation.	F.10.3, G.4.5	3.5	P1
SC.40	Manually and visually checks the conformity of the assembled engine, device and accessories.	B.1.2-4, B.2.1-3, F.10.4, G.4.5	3.5	P1

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No.	Statement of Skills and Competencies	National Occupational Standards Related Section	Qualification Unit Performance Criteria	Assessment Tool
*SC.41	Gradually energizes the installed installation in accordance with the relevant technical procedure.	G.1.1	4.1	P1
*SC.42	Checks whether there is power at the installation with suitable measuring instruments (control pen, multimeter etc.).	G.1.2	4.1	P1
*SC.43	Checks whether the installation operates with the correct values by making voltage, grounding and current measurements with appropriate measuring instruments.	B.2.1-3, F.1.8, G.2.1-3	4.2	P1
SC.44	Checks the operating status of the devices in the installation according to relevant techniques.	B.2.1-3, G.2.2	4.2	P1
SC.45	Visually checks whether the visible parts of the grounding are connected securely.	B.2.1-3, F.1.8, G.3.1	4.2	P1
SC.46	Measures the resistance value of the grounding with the appropriate measuring instrument (meger, etc.).	B.2.1-3, F.1.8, G.3.2	4.2	P1
*SC.47	Checks the operating status of the devices in the installation and air temperature.	B.2.1-3, G.3.3	4.2	P1
SC.48	Visually inspects the cables, cable ducts and panels that provide electricity distribution and determines nonconformities.	G.4.1	5.1	P1
*SC.49	Measures and checks grounding breaks or connections manually, visually and by megger.	G.4.2	5.1	P1
*SC.50	Conducts loaded/unloaded or energized/non-energized measurements and detects nonconformities.	G.4.3	5.1	P1
SC.51	Checks and supervises the lighting of the areas and the functionality of the switches.	G.4.4	5.1.	P1
SC.52	Determines the power lines of the electrical installation, and the wear conditions of the security and control systems.	G.4.1-4	5.1.	P1
*SC.53	Cuts the energy of the installation to be dismantled in accordance with the relevant procedure.	F.11.1	5.2.	P1
*SC.54	Insulates the open terminals separated from their connections.	F.11.2	5.2.	P1
SC.55	Disassembles the accessories and assembly materials used in the installation.	F.11.3	5.2.	P1
SC.56	Performs the classification and marking of the cables and materials used in the installation.	F.11.4	5.2.	P1
*SC.57	Uses work clothing and personal protective equipment suitable for the job.	A.1.2	6.1	P1
*SC.58	Places the warning signs and plates of the work performed in accordance with the instructions.	A.1.4	6.1	P1
*SC.59	Ensures temporary storage of dangerous and hazardous wastes by taking the necessary measures.	B.2.2	6.2	P1
*SC.60	Describes how to comply with the quality requirements allowed in the application.	C.1.1	6.2	P1
*SC.61	Applies the quality requirements according to the tolerances and deviations allowed in the application.	C.1.2	6.2	P1

(*) Critical steps that must be accomplished in the practical exam

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QUALIFICATION ANNEXES

ANNEX 1: Qualification Units

15UY0241-4/A1: Occupational Health and Safety, Environmental Protection and Work Organization
15UY0241-4/B1: Electrical Interior Installation Project Preparation
15UY0241-4/B2: Electrical Interior Installation Application

ANNEX 2: Terms, Symbols and Abbreviations

CURRENT: Electron flow occurring in a conductor,

LOW VOLTAGE: The voltage with effective value of 1000 volts and below,

AMPERE: Current intensity unit,

MULTIMETER: Electronic instrument that can measure current (ampere), voltage (volt), resistance (ohm) and short circuit,

JUNCTION BOX: The box used to combine in electrical installations or to divide the current into one or more branches,

BUSBAR: The equipment that provides the electrical energy in the transmission and distribution to the devices to be used with its own internal mechanism and without any additional material,

ENVIRONMENTAL PROTECTION: Use of materials or processes that do not harm the environment, in the studies, or disposing of hazardous wastes properly.

ANNEX 2: Terms, Symbols and Abbreviations
VOLTAGE: The potential difference between two conductors,

ISCO: International Standard Classification of Occupations

CONDUCTOR CROSS-SECTION: The area in square millimeters of conductors such as copper, aluminum, chrome-nickel used in electrical installations when they are cut transversely, excluding insulation thickness,

CONDUCTOR: Materials that conduct electric current,

OHS: Occupational Health and Safety.

STRAY CURRENT RELAY: The device that detects the fault current caused by the insulation fault in the electrical installation and cuts the circuit to which it is connected in case the detected stray current value exceeds the threshold values,

FRAME: Materials used to mount switches, sockets, etc. to the wall,

GUIDE: Steel or plastic wire used to pass conductors through pipes,

KILOWATT: Electrical power unit,

PERSONAL PROTECTIVE EQUIPMENT (PPE): Refers to any device, tool, or material designed to be worn or carried by persons to be protected against one or more health and safety hazards,

TERMINAL BOX: The device used to attach the conductors to each other,

CODING: Colors to be used for conductors in electrical interior installations (for protective conductors: green-yellow, for medium and neutral conductors: light blue, for phase conductors: different colors for each phase in accordance with current cable standards),

COMPENSATION: The system that regulates the phase difference between voltage and current of inductive or capacitive loads and keeps them close to the ideal (0 degrees),

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CORROSION: The state of corrosion of metal or metal alloys due to oxidation or other chemical effects,

STRONG CURRENT: Current that is hazardous for people and goods under normal situations,

MEGGER: The instrument that measures the insulation resistance,

ASSEMBLY MATERIALS: Switches, sockets, junction boxes, lamps, etc. materials,

OHM: Unit of resistance,

MEASUREMENT AND DISTRIBUTION PANELS: The control panel that measures, distributes, protects and controls electrical energy inside and outside the building,

LIGHTNING ROD: The installation established against fires and life-threatening hazards that may arise as a result of a lightning strike,

PVC (POLYVINYL CHLORIDE): A type of polymer used in the construction of electrical cables,

RISK ASSESSMENT: Necessary works to detect the internal and external risks at work, to analyze and rank the factors that cause these hazards to turn into risks and the risks caused by hazards, and to determine the control measures.

RISK: Composition of the probability of occurrence of a dangerous incident and its consequences.

HAZARD: The potential for harm or damage that exists in the workplace or may come from outside, which may affect the employee or the workplace.

INSTALLATION ACCESSORIES: Electrical devices and the materials controlling these devices,

INSTALLATION PROJECT: The design of the electrical installation to be assembled in accordance with the architectural project, which includes drawings and calculations in certain standards and scales,

INSTALLATION: The entire system (lighting, socket, power, telephone, voice-over, fire alarm, etc.) prepared using fuses and infrastructure electrical materials (junction boxes, terminals, pipes, etc.), various switches, conductors, sockets, in accordance with the characteristics of the receivers (lathe, iron, washing machine, electric sewing machine, lamp, etc.) where electricity will be supplied based on their places of use.

GROUNDING: The connection of non-active sections and zero conductors and their connected sections to the ground in a conductive manner with the aid of an electrode in electrical facilities.

APPLICATION AREA: The environment where the electrical installation will be assembled (housing, workplaces, businesses, outdoor areas etc.),

SITUATION PLAN: A drawing of the location of the installation within the area by specifying the directions (North-South-East-West),

WATT: Unit of power in electricity,

WEAK CURRENT: The current that is not hazardous for people and goods under

normal conditions.

ANNEX 3: Horizontal and Vertical Progression Paths in the Occupation

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ANNEX 4: Evaluator Criteria

An evaluator must fulfill one of the requirements described below:

- Having been an Electrical Engineer, Electrical and Electronics Engineer with a minimum of five (5) years of actual experience in electrical interior installation projects and application works
- Having actually provided training as an Electrical branch instructor for at least 3 years in vocational and technical education institutions
- Having actually performed the occupation of electrician for a minimum of ten (10) years, including preparing interior installation projects,
  and served as a master trainer for a minimum of five (5) years.

Evaluators who possess the above-mentioned characteristics and who will participate in the assessment and evaluation process should be trained in vocational qualification system, relevant national qualification(s), relevant national occupational standard(s), assessment and evaluation, and quality assurance in assessment and evaluation by institutions authorized in the relevant field.