

National Occupational Skill Standard (NOSS)

Occupational Title : Building Electrician
Level : 2
Sector : Electrical
Sub - Sector : Building Electrification
NOSS ID/NSCO ID :
ISCO NO :



Council for Technical Education and Vocational Training
NATIONAL SKILL TESTING BOARD
Madhyapur Thimi-17, Sanothimi, Bhaktapur, Nepal

Developed: 2019-04-01



2045

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Designation:

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June, 2001



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The National Occupational Skill Standard Developed by:

No	Name	Designation	Organization
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Recommended by Electrical Technical Sub Committee: 01 April 2019 (18 Chaitra 2075)



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1	Occupational Title: Building Electrician Level: 2
2	Job Description: Building Electrician, L-2, prepares electrical diagram, installs, connects, tests and repairs single phase domestic wiring and earthing system. And also installs three phase energy meter, main sub distribution board with single phase sub distribution boards and motor.
	UNITS OF COMPETENCY: 1. Prepare electrical diagram. 2. Install single phase domestic wiring. 3. Install three phase electrical fittings in domestic wiring 4. Install earthing/grounding system. 5. Repair domestic wiring system. 6. Perform electrical testing. 7. Perform communication. 8. Develop professionalism. <i>*Note: Unit 7 and 8 are not for testing purpose.</i>
4	Qualifying Notes/Prerequisites: • Physical Requirements: Sound health • Entry Requirements: As per NSTB rules. Additional Information: • Assessment Types: Performance test only. • Assessment Duration: 9 to 12 Hrs • Recommended Group Size: 8 to 10 candidates



5	Unit No:1 Unit Title: Prepare electrical diagram	Unit code:
	Elements of competency	Performance standards
	1.1 Prepare layout diagram/sketch	1.1.1 Electrical fittings, accessories and Distribution Board (DB) depicted through simplified notation in layout drawing. 1.1.2 Position of electrical fittings and accessories clearly mentioned in layout drawing.
	1.2 Prepare single line diagram	1.2.1 Single line diagram prepared from utility supply to main distribution board. 1.2.2 Details from main distribution board to Sub Distribution Boards (SDBs) depicted in single line diagram. 1.2.3 No of conductors, conductor size and ratings of MCBs depicted in single line diagram.
	1.3 Draw connection/wiring diagram	1.3.1 Connection/wiring diagram prepared according to requirement. 1.3.2 Separate lines for phase, neutral and earth wire clearly depicted in diagram. 1.3.3 Phase line connected to protective and control device.
	1.4 Prepare As-Built diagram	1.4.1 Modification updated in existing drawing as per site condition.
6	Task Performance Requirements (Tools, Equipment and Materials): Pencil, scale/ruler, eraser, drawing paper, template, drawing board, T-square, set square, sharpener, compass and Personal Protective Equipment (PPE).	
7	Safety and Hygiene (Occupational Health and Safety): - Use Personal Protective Equipment (PPE). - Safe handling of materials, tools and equipment.	



8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	• Drawing instrument ○ Introduction ○ Types ○ Guidelines • Basic architectural drawing • Electrical symbols and legends ○ Definition ○ Types ○ Lines ○ Uses • Types of electrical diagrams • Types and uses of line	• Perform four basic fundamental operations • Convert metric unit to imperial and vice versa	• Read and interpret electrical drawings. • Read and interpret instruction guide/manual.



9	Assessment of Competency						
	Unit: 1 Unit Title: Prepare electrical diagram						
	Candidate Details			Assessors Detail			
	Candidate's Name: Registration Number: Symbol No: Test Centre:			Assessors' Name 1. 2. 3.		ID/License No:	
Element of competency		Performance Standards		Standard Met	Standard Not Met	Evidence Type	Comments
1.1 Prepare layout diagram/sketch		1.1.1 Electrical fittings, accessories and DB depicted through simplified notation in layout drawing. 1.1.2 Position of electrical fittings and accessories clearly mentioned in layout drawing.					
1.2 Prepare single line diagram		1.2.1 Single line diagram prepared from utility supply to main distribution board. 1.2.2 Details from main distribution board to Sub Distribution Boards (SDBs) depicted in single line diagram. 1.2.3 No of conductors, conductor size and ratings of MCBs depicted in single line diagram.					
1.3 Draw connection/wiring diagram		1.3.1 Connection/wiring diagram prepared according to requirement. 1.3.2 Separate line for phase, neutral and earth wire clearly depicted in diagram. 1.3.3 Phase line connected to protective and control device.					
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1.4 Prepare As Built diagram	1.4.1 Modification updated in existing drawing as per site condition.				
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WT- Written Test

OQ- Oral Question

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DO – Direct Observation

SR- Supervisor’s report

SN–Simulation

RP- Role Play

PG –Photographs

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5	Unit No:2 Unit Title: Install single phase domestic wiring	Unit code:
	Elements of competency	Performance standards
	2.1 Install surface wiring	2.1.1 Ceiling/wall clearly marked for electrical fittings and accessories as per layout diagram. 2.1.2 PVC duct/conduit selected as per number of wires and firmly fixed along the marked location. 2.1.3 PVC boxes firmly fixed for switches and sockets. 2.1.4 Wire laid as per layout diagram considering color code .
	2.2 Install conceal wiring	2.2.1 Marked on ceiling as per layout diagram. 2.2.2 Wall cut as per layout diagram. 2.2.3 Metal box, Junction box and DB firmly fixed on marked position. 2.2.4 PVC pipe laid on wall, floor and ceiling as per lay out diagram. 2.2.5 Wire laid as per layout diagram considering color code .
	2.3 Install and connect electrical fittings and accessories	2.3.1 Electrical fittings and accessories checked for physical damage and functioning. 2.3.2 ON/OFF continuity checked. 2.3.3 Adequate insulation removed at the termination point without damaging conductor. 2.3.4 Spare wire provided as required. 2.3.5 Wires tightly connected to electrical fittings and accessories without damaging conductor. 2.3.6 Phase wire securely connected from fuse/MCB to switch. 2.3.7 Electrical fittings and accessories firmly installed.
	2.4 Install and connect DB	2.4.1 DB checked for physical damage and functioning. 2.4.2 ON/OFF continuity checked. 2.4.3 Adequate insulation removed at the termination point without damaging conductor. 2.4.4 Spare wire provided as required. 2.4.5 Wires tightly connected to DB without damaging conductor. 2.4.6 Phase wire securely connected to fuse/MCB.



		2.4.7 Earth wire connected to DB body/Earth connector. 2.4.8 Neutral wire connected to neutral bus bar/neutral connector. 2.4.9 DB firmly installed.
	2.5 Install main switch and change over switch	2.5.1 Main switch and change over switch checked for physical damage and functioning. 2.5.2 ON/OFF continuity checked. 2.5.3 Adequate insulation removed at the termination point without damaging conductor. 2.5.4 Spare wire provided as required. 2.5.5 Wires tightly connected to main switch and change over switch without damaging conductor. 2.5.6 Phase wire and neutral wire securely connected to input terminal. 2.5.7 Output terminal securely connected to DB. 2.5.8 Earth wire connected to main switch and change over switch body. 2.5.9 Main switch and change over switch firmly installed.
	2.6 Install electrical backup system	2.6.1 Back up supply connected to change over switch. 2.6.2 Output terminals connected to load as per requirement.
6	Task Performance Requirements (Tools, Equipment and Materials): Drawing, chalk/pencil, measuring tape, plumb-bob, portable drill machine, drill bits, screw, nail, trowel, shovel, pan, screw driver set, hammer, knife, scissor, chisel, spirit level, wire striper, combination plier, side cutter, tools bag, phase tester, wall cutter, wall plugs/grips, metal/PVC boxes, blocks extension cable, hacksaw, PVC duct/conduit, wire, main switch, change over switch, DB box, switch box, socket outlet, indicator, DOL switch, one way switch, alternate switch, intermediate switch, push switch, holder, tube light, fan regulator, fan, bulb, buzzer, ceiling rose, connectors, SP MCB, DP MCB, insulation tape, fish/pull wire, single phase energy meter, saddle, circular box, junction box, PVC T, PVC elbow, backup source and PPE.	



7

Safety and Hygiene (Occupational Health and Safety):

- Use Personal Protective Equipment (PPE).
- Safe handling of materials, tools and equipment.
- Hazards involved in lifting materials, tools and equipment.
- Hazards associated with sharp cutting tools.
- Hazards associated with electrical works.
- Switch OFF main supply during test commission.



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8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	- Electrical parameter - Voltage - Current - Resistance - Power - Frequency - Energy - Relation between voltage, current, resistance and power - Duct/conduit pipe: - Types - Size - Maximum/allowable no of wires - Types & sizes of boxes - Purpose of spare wire - Methods of marking - Importance of de-burring - Proportion of sand, cement and water mixture and its applications - Energy meter - Introduction - Types - uses - Connection method - Wire/cable - Introduction - Types - Sizes - Uses	Calculate voltage, current, resistance, power and energy.	Read and interpret manual/instructional guide.



	• Selection of cables and wires ○ Main cable ○ Sub main cable ○ Light cable ○ Power cable • Electrical circuit ○ Introduction ○ Types (Series and parallel) ○ Application ○ Connection • Introduction of conductor and insulator • Protective device ○ Introduction ○ Types ○ Importance • Use of pull/fish wire • Backup system: ○ Backup source (Generator, PV Solar, Inverter) ○ Full ○ Partial/Selective ○ Separate color wire for backup system • Supply system: ○ Introduction ○ Types (AC and DC) ○ Single phase distribution ○ Three phase distribution ○ Light circuit and power circuit		
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9	Assessment of Competency						
	Unit: 2 Unit Title: Install single phase domestic wiring						
	Candidate Details			Assessors Detail			
	Candidate's Name: Registration Number: Symbol No: Test Centre:			Assessors' Name 1. 2. 3.		ID/License No:	
Element of competency		Performance Standards		Standard Met	Standard Not Met	Evidence Type	Comments
2.1 Install surface wiring		2.1.1 Ceiling/wall clearly marked for electrical fittings and accessories as per layout diagram. 2.1.2 PVC duct/conduit selected as per number of wires and firmly fixed along the marked location. 2.1.3 PVC boxes firmly fixed for switches and sockets. 2.1.4 Wire laid as per layout diagram considering color code .					
2.2 Install conceal wiring		2.2.1 Marked on ceiling as per layout diagram. 2.2.2 Wall cut as per layout diagram. 2.2.3 Metal box, Junction box and DB firmly fixed on marked position. 2.2.4 PVC pipe laid on wall, floor and ceiling as per lay out diagram. 2.2.5 Wire laid as per layout diagram considering color code .					



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2.3 Install and connect electrical fittings and accessories	2.3.1 Electrical fittings and accessories checked for physical damage and functioning. 2.3.2 ON/OFF continuity checked. 2.3.3 Adequate insulation removed at the termination point without damaging conductor. 2.3.4 Spare wire provided as required. 2.3.5 Wires tightly connected to electrical fittings and accessories without damaging conductor. 2.3.6 Phase wire securely connected from fuse/MCB to switch. 2.3.7 Electrical fittings and accessories firmly installed.				
2.4 Install and connect DB	2.4.1 DB checked for physical damage and functioning. 2.4.2 ON/OFF continuity checked. 2.4.3 Adequate insulation removed at the termination point without damaging conductor. 2.4.4 Spare wire provided as required. 2.4.5 Wires tightly connected to DB without damaging conductor. 2.4.6 Phase wire securely connected to fuse/MCB. 2.4.7 Earth wire connected to DB body/Earth connector. 2.4.8 Neutral wire connected to neutral bus bar/neutral connector. 2.4.9 DB firmly installed.				
2.5 Install main switch and change over switch	2.5.1 Main switch and change over switch checked for physical damage and functioning. 2.5.2 ON/OFF continuity checked. 2.5.3 Adequate insulation removed at the termination				



	point without damaging conductor. 2.5.4 Spare wire provided as required. 2.5.5 Wires tightly connected to main switch and change over switch without damaging conductor. 2.5.6 Phase wire and neutral wire securely connected to input terminal. 2.5.7 Output terminal securely connected to DB. 2.5.8 Earth wire connected to main switch and change over switch body. 2.5.9 Main switch and change over switch firmly installed.				
2.6 Install electrical backup system	2.6.1 Back up supply connected to change over switch. 2.6.2 Output terminals connected to load as per requirement.				

WT- Written Test

OQ- Oral Question

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Range Statement

Variable	Range	
Electrical fittings and accessories	<i>May include but not limited to:</i> • One-way switch • Two-way(alternate) switch • Push bottom switch • Intermediate switch • DOL Switch • Change over switch • Switch plate • Indicator • Socket outlet • Holder • Ceiling rose • Fan regulator/dimmer switch • PVC duct/conduit	• Tube light set • Main switch • DB box • Switch box • Connectors • MCB (SP, DP, TP, TPN) • Bus bar • Single phase energy meter • Saddle • Circular box • Junction box • PVC T, PVC elbow • Wall/Ceiling/Exhaust Fan
Color code	<i>May include but not limited to:</i> • Black for neutral • Red, yellow, Blue for Phase. • Green for earthing	
Spare wire	<i>May include but not limited to:</i> • Switch/Socket box: 150 to 300 mm • DB: 300 to 600 mm • Light fixtures: 150 to 300 mm	



5	Unit No:3 Unit Title: Install three phase electrical fittings in domestic wiring	Unit code:
	Elements of competency	Performance standards
	3.1 Install and connect single/three phase distribution board	3.1.1 Distribution board (DB) checked for physical damage and functioning. 3.1.2 ON/OFF continuity checked. 3.1.3 Adequate insulation removed at the termination point without damaging conductor. 3.1.4 Spare wire provided as required. 3.1.5 Wires tightly connected to DB without damaging conductor. 3.1.6 R, Y and B phase wires respectively connected to MCB. 3.1.7 Phase wire securely connected to fuse/MCB. 3.1.8 Neutral wire connected to neutral bus bar. 3.1.9 Earth wire connected to Earth connector/bus bar. 3.1.10 DB firmly installed.
	3.2 Install and connect single/three phase motor control switch and motor	3.2.1 Motors and accessories for electrical and mechanical functions checked for working condition. 3.2.2 Foundation for installation of motor located and prepared as per drawing. 3.2.3 Location for protective device & switch/DOL starter located as per drawing and marked clearly. 3.2.4 Holes drilled at marked place & switch, DOL starter, motor tightly installed and aligned. 3.2.5 Main supply connected to input terminals of DOL starter. 3.2.6 Output connected to three phase motor terminals in sequential order. 3.2.7 Wires uniformly harnessed. 3.2.8 Single/three phase load checked for free rotation and alignment.
	3.3 Install and connect single/three phase energy meter	3.3.1 Location marked clearly as per drawing. 3.3.2 Single/three phase energy meter installed vertically straight on marked location. 3.3.3 Input supply tightly connected in input terminals as specified in single/three phase



		energy meter. 3.3.4 Output supply tightly connected to main switch as specified in single/three phase energy meter.
6	Task Performance Requirements (Tools, Equipment and Materials): Drawing, chalk/pencil, measuring tape, plumb-bob, portable drill machine, drill bits, screw, nail, trowel, shovel, pan, screw driver set, hammer, knife, scissor, chisel, spirit level, wire stripper, combination plier, side cutter, tool bag, phase tester, wall cutter, wall plugs/grips, extension cable, hacksaw, PVC duct/conduit, wire, cable, main switch, change over switch, three phase main DB, single phase sub DBs, DOL switch, connectors, SP MCB, DP MCB, TP MCB, TPN MCB, MCCB, ELCB, bus bar, insulation tape, single/three phase energy meter, saddle, single/three motor, phase sequence tester, insulation tester and PPE.	
7	Safety and Hygiene (Occupational Health and Safety): - Use Personal Protective Equipment (PPE). - Safe handling of materials, tools and equipment. - Hazards involved in lifting materials, tools and equipment. - Hazards associated with sharp cutting tools. - Hazards associated with electrical works. - Switch OFF main supply during test commission.	



8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	• Three phase system ○ Introduction ○ Application ○ Phase sequence ○ Balance load and unbalance load ○ Color code ○ Line voltage and phase voltage • Electrical motor ○ Introduction ○ Types ○ Application ○ Connection (Star and Delta) ○ Rotation of motor • Three phase energy meter ○ Introduction ○ Types ○ Connection • Distribution board ○ Introduction ○ Types ○ Connection • Current rating capacity of conductors • Selection of conductors • MCB ○ Introduction ○ Selection and application ○ Types	• Calculate power. • Calculate conductor size. • Calculate fuse/MCB rating.	• Read and interpret drawing. • Read and interpret manual/instructional guide.



9	Assessment of Competency						
	Unit: 3 Unit Title: Install three phase electrical fittings in domestic wiring						
	Candidate Details			Assessors Detail			
	Candidate's Name: Registration Number: Symbol No: Test Centre:			Assessors' Name 1. 2. 3.		ID/License No:	
Element of competency		Performance Standards		Standard Met	Standard Not Met	Evidence Type	Comments
3.1 Install and connect single/three phase distribution board		3.1.1 Distribution board (DB) checked for physical damage and functioning. 3.1.2 ON/OFF continuity checked. 3.1.3 Adequate insulation removed at the termination point without damaging conductor. 3.1.4 Spare wire provided as required. 3.1.5 Wires tightly connected to DB without damaging conductor. 3.1.6 R, Y and B phase wires respectively connected to MCB. 3.1.7 Phase wire securely connected to fuse/MCB. 3.1.8 Neutral wire connected to neutral bus bar. 3.1.9 Earth wire connected to Earth connector/bus bar. 3.1.10 DB firmly installed.					



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3.2 Install and connect single/three phase motor control switch and motor	3.2.1 Motors and accessories for electrical and mechanical functions checked for working condition. 3.2.2 Foundation for installation of motor located and prepared as per drawing. 3.2.3 Location for protective device & switch/DOL starter located as per drawing and marked clearly. 3.2.4 Holes drilled at marked place & switch, DOL starter, motor tightly installed and aligned. 3.2.5 Main supply connected to input terminals of DOL starter. 3.2.6 Output connected to three phase motor terminals in sequential order. 3.2.7 Wires uniformly harnessed. 3.2.8 Single/three phase load checked for free rotation and alignment.				
3.3 Install and connect single/three phase energy meter	3.3.1 Location marked clearly as per drawing. 3.3.2 Single/three phase energy meter installed vertically straight on marked location. 3.3.3 Input supply tightly connected in input terminals as specified in single/three phase energy meter. 3.3.4 Output supply tightly connected to main switch as specified in single/three phase energy meter.				

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5	Unit No: 4 Unit Title: Install earthing/grounding system	Unit code:
	Elements of competency	Performance standards
	4.1 Perform plate earthing	4.1.1 Materials prepared for earthing. 4.1.2 Earthing pit of size 1500mm to 3000mm prepared at least 1500mm away from home as per soil type . 4.1.3 Brazed earth plate vertically placed in center at the depth of 1500mm. 4.1.4 Pit filled with alternate 150 mm layer of charcoal and soil around the earth plate. 4.1.5 Water funneling system installed. 4.1.6 Soil filled up to the surface level. 4.1.7 Earth resistance tested for acceptable range . 4.1.8 Earth wire connected with cable shoes to earth point of main panel/distribution box.
	4.2 Perform rod earthing	4.2.1 Materials prepared for earthing. 4.2.2 A copper rod of length 2500 mm and 12.5mm diameter vertically placed in the pit prepared at least 1500mm away from home. 4.2.3 Earth resistance tested for acceptable range . 4.2.4 Earth continuity wire connected from copper rod to main panel/DB.
	4.3 Perform pipe earthing	4.3.1 Materials prepared for earthing. 4.3.2 Earthing pit of size 2500mm to 3000mm prepared at least 1500mm away from home as per soil type . 4.3.3 12mm hole drilled at the distance of 150mm on pipe of size 2500mm length and 38mm diameter. 4.3.4 Brazed earth pipe vertically placed in center at the depth of 2500mm. 4.3.5 Pit filled with alternate 150 mm layer of charcoal and soil around the earth plate. 4.3.6 Water funneling system installed. 4.3.7 Soil filled up to the surface level. 4.3.8 Earth resistance tested for acceptable range .



		4.3.9 Earth wire connected with cable shoes to earth point of main panel/distribution box.
	4.4 Perform chemical earthing	4.4.1 Chemical compound prepared for earthing. 4.4.2 Earthing pit of size 2000mm to 3000mm prepared at least 1500mm away from home as per soil type . 4.4.3 Earth electrode vertically placed in center at the depth of 2000mm. 4.4.4 Pit filled with chemical compound. 4.4.5 Water funneling system installed. 4.4.6 Soil filled up to the surface level. 4.4.7 Inspection pit installed. 4.4.8 Earth resistance tested for acceptable range . 4.4.9 Earth wire connected with cable shoes to earth point of main panel/distribution box.
6	Task Performance Requirements (Tools, Equipment and Materials): Drawing, measuring tape, plumb-bob, Screw driver set, hammer, knife, adjustable wrench, chisel, wire stripper, combination plier, side cutter, tool bag, phase tester, wall cutter, wall plugs/grips, extension cable, hacksaw, earth wire, insulation tester, Earthing plate, Earthing rod, Earth resistance tester, heater/voltmeter, chemical earth electrode, chemical compound, charcoal, funnel, cable shoes, crimping tools, shovel, pan, pick, cement, sand, GI pipe(19 and 38mm), PVC pipe and PPE.	
7	Safety and Hygiene (Occupational Health and Safety): - Use Personal Protective Equipment (PPE). - Safe handling of materials, tools and equipment. - Hazards involved in lifting materials, tools and equipment. - Hazards associated with sharp cutting tools. - Hazards associated with electrical works. - Switch OFF main supply during test commission.	



8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	- Tools and equipment - Types - Uses - Safe handling - Earthing: - Introduction - Importance - Types - Method - Acceptable range - Methods of improvement - Earthing materials - Types of Soil		- Read and interpret drawing. - Read and interpret manual/instructional guide.



9	Assessment of Competency						
	Unit: 4 Unit Title: Install earthing/grounding system						
	Candidate Details			Assessors Detail			
	Candidate's Name: Registration Number: Symbol No: Test Centre:			Assessors' Name 1. 2. 3.		ID/License No:	
Element of competency		Performance Standards		Standard Met	Standard Not Met	Evidence Type	Comments
4.1 Perform plate earthing		4.1.1 Materials prepared for earthing. 4.1.2 Earthing pit of size 1500mm to 3000mm prepared at least 1500mm away from home as per soil type . 4.1.3 Brazed earth plate vertically placed in center at the depth of 1500mm. 4.1.4 Pit filled with alternate 150 mm layer of charcoal and soil around the earth plate. 4.1.5 Water funneling system installed. 4.1.6 Soil filled up to the surface level. 4.1.7 Earth resistance tested for acceptable range . 4.1.8 Earth wire connected with cable shoes to earth point of main panel/distribution box.					
4.2 Perform rod earthing		4.2.1 Materials prepared for earthing. 4.2.2 A copper rod of length 2500 mm and 12.5mm diameter vertically placed in the pit prepared at least 1500mm away					



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	from home. 4.2.3 Earth resistance tested for acceptable range. 4.2.4 Earth continuity wire connected from copper rod to main panel/DB.				
4.3 Perform pipe earthing	4.3.1 Materials prepared for earthing. 4.3.2 Earthing pit of size 2500mm to 3000mm prepared at least 1500mm away from home as per soil type. 4.3.3 12mm hole drilled at the distance of 150mm on pipe of size 2500mm length and 38mm diameter. 4.3.4 Brazed earth pipe vertically placed in center at the depth of 2500mm. 4.3.5 Pit filled with alternate 150 mm layer of charcoal and soil around the earth plate. 4.3.6 Water funneling system installed. 4.3.7 Soil filled up to the surface level. 4.3.8 Earth resistance tested for acceptable range. 4.3.9 Earth wire connected with cable shoes to earth point of main panel/distribution box.				
4.4 Perform chemical earthing	4.4.1 Chemical compound prepared for earthing. 4.4.2 Earthing pit of size 2000mm to 3000mm prepared at least 1500mm away from home as per soil type. 4.4.3 Earth electrode vertically placed in center at the depth of 2000mm. 4.4.4 Pit filled with chemical compound. 4.4.5 Water funneling system installed. 4.4.6 Soil filled up to the surface level. 4.4.7 Inspection pit installed.				



	4.4.8 Earth resistance tested for <i>acceptable range</i> .				
	4.4.9 Earth wire connected with cable shoes to earth point of main panel/distribution box.				

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Range Statement

Variable	Range									
Soil type	<i>May include but not limited to:</i> <table><tr><td></td><td>Plate Earthing</td><td>Pipe Earthing</td></tr><tr><td>• Wet</td><td>1500 mm depth</td><td>2500 mm depth</td></tr><tr><td>• Dry</td><td>More than 1500 mm depth</td><td>3000 mm depth</td></tr></table>		Plate Earthing	Pipe Earthing	• Wet	1500 mm depth	2500 mm depth	• Dry	More than 1500 mm depth	3000 mm depth
	Plate Earthing	Pipe Earthing								
• Wet	1500 mm depth	2500 mm depth								
• Dry	More than 1500 mm depth	3000 mm depth								
Earth plate	<i>May include but not limited to:</i> • Copper plate: 600 mm X 600 mm X 3.15 mm • For other materials: more than copper plate									
Acceptable range	<i>May include but not limited to:</i> • Domestic: 10 ohm or below • Industry: 5 ohm or below									



5	Unit No: 5 Unit Title: Repair domestic wiring system	Unit code:
	Elements of competency	Performance standards
	5.1 Perform visual inspection	5.1.1 System information collected. 5.1.2 Physical status of domestic wiring system inspected. 5.1.3 Fault located/identified.
	5.2 Diagnose fault	5.2.1 Electrical test performed. 5.2.2 System checked for electrical circuit . 5.2.3 Fault located/identified.
	5.3 Rectify fault	5.3.1 Electrical system switched OFF. 5.3.2 Loosen parts and fittings tightened. 5.3.3 Damaged accessories and fittings removed. 5.3.4 Faulty accessories and fittings repaired or replaced. 5.3.5 Electrical system tested for functionality.
6	Task Performance Requirements (Tools, Equipment and Materials): Drawing, chalk/pencil, measuring tape, plumb-bob, portable drill machines drill bits, screw, nail, trowel, shovel, pan, screw driver set, hammer, knife, scissor, chisel, spirit level, wire striper, combination plier, adjustable wrench, side cutter, tool bag, multi meter, continuity tester, insulation tester, phase tester, Earth resistance tester, heater/voltmeter, wall cutter, wall plugs/grips, boxes, blocks extension cable, hacksaw, PVC duct/conduit, wire, cable, main switch, change over switch, DB box, switch box, socket outlet, indicator, DOL switch, one way switch, alternate switch, intermediate switch, push switch, holder, tube light, fan regulator, fan, bulb, buzzer, ceiling rose, connectors, SP MCB, DP MCB, TP MCB, TPN MCB, MCCB, ELCB, insulation tape, single phase energy meter, motor, saddle, circular box, Junction box, PVC T, PVC elbow and PPE.	



7

Safety and Hygiene (Occupational Health and Safety):

- Use Personal Protective Equipment (PPE).
- Safe handling of materials, tools and equipment.
- Hazards involved in lifting materials, tools and equipment.
- Hazards associated with sharp cutting tools.
- Hazards associated with electrical works.
- Switch OFF main supply during test commission.



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8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	- Tools and equipment: - Types - Uses - Safe handling - Repair and maintenance: - Introduction - Importance - Condition assessment - Types of maintenance - Fault finding techniques - Resolving techniques - Electrical circuit: - Introduction - Types (Light, power, sub main, main) - Condition of circuit (Open, close, short, overload, earth leakage)		- Read and interpret manual/instructional guide. - Read and interpret As built diagram.



9	Assessment of Competency						
	Unit: 5 Unit Title: Repair domestic wiring system						
	Candidate Details			Assessors Detail			
	Candidate's Name: Registration Number: Symbol No: Test Centre:			Assessors' Name 1. 2. 3.		ID/License No:	
Element of competency		Performance Standards		Standard Met	Standard Not Met	Evidence Type	Comments
5.1 Perform visual inspection		5.1.1 System information collected. 5.1.2 Physical status of domestic wiring system inspected. 5.1.3 Fault located/identified.					
5.2 Diagnose fault		5.2.1 Electrical test performed. 5.2.2 System checked for electrical circuit . 5.2.3 Fault located/identified.					
5.3 Rectify fault		5.3.1 Electrical system switched off/shut down. 5.3.2 Loosen parts and fittings tightened. 5.3.3 Damaged accessories and fittings removed. 5.3.4 Faulty accessories and fittings repaired or replaced. 5.3.5 Electrical system tested for functionality.					

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Range Statement

Variable	Range
Physical status	<i>May include but not limited to:</i> • Fire burn • Melting • Damage • Breakage • Loose connection • Disconnection
Electrical circuit	<i>May include but not limited to:</i> • Short circuit • Open circuit • Earth fault • Leakage



5	Unit No: 6 Unit Title: Perform electrical testing		Unit code:	
	Elements of competency		Performance standards	
	6.1 Perform visual inspection	6.1.1	System information collected.	
		6.1.2	Physical status of domestic wiring system inspected.	
	6.2 Test continuity	6.2.1	Switch OFF power to the circuit being tested.	
		6.2.2	Continuity tester selected.	
		6.2.3	Continuity of electrical wires and accessories tested.	
	6.3 Test insulation	6.3.1	Switch OFF power to the circuit being tested.	
		6.3.2	Voltage and Ohm scale set to appropriate range.	
		6.3.3	All loads removed from circuit being tested.	
		6.3.4	All switches and MCBs turned ON.	
		6.3.5	Insulation tested between phase to neutral conductor.	
		6.3.6	Insulation tested between phase to phase conductor.	
	6.4 Test short circuit	6.3.7	Insulation tested between neutral to earth.	
		6.3.8	Insulation tested between phase to earth.	
		6.4.1	Switch OFF power to the circuit being tested.	
	6.5 Test polarity	6.4.2	Continuity tester selected.	
		6.4.3	Continuity of electrical wires and accessories tested.	
		6.5.1	Main supply turned ON.	
	6.6 Test earth resistance	6.5.2	Polarity tested for each MCBs and switches.	
		6.5.3	Polarity of power socket tested.	
		6.6.1	Voltmeter/heater connected to phase and earth wire.	
		6.6.2	Earth resistance tested.	



6	Task Performance Requirements (Tools, Equipment and Materials): • Multimeter, Insulation tester, phase tester, Phase sequence tester, socket polarity tester, continuity tester, heater/voltmeter, Earth resistance tester, tool bag and PPE.
7	Safety and Hygiene (Occupational Health and Safety): • Use Personal Protective Equipment (PPE). • Safe handling of materials, tools and equipment. • Hazards involved in lifting materials, tools and equipment. • Hazards associated with sharp cutting tools. • Hazards associated with electrical works. • Switch OFF main supply during test commission.



8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	• Tools and equipment ○ Types ○ Uses ○ Safe handling • Electrical circuit testing ○ Types ○ Method ○ Purpose		• Read and interpret drawing. • Read and interpret manual/instructional guide.



9	Assessment of Competency						
	Unit: 6 Unit Title: Perform electrical testing						
	Candidate Details			Assessors Detail			
	Candidate's Name: Registration Number: Symbol No: Test Centre:			Assessors' Name 1. 2. 3.		ID/License No:	
Element of competency		Performance Standards		Standard Met	Standard Not Met	Evidence Type	Comments
6.1 Perform visual inspection		6.1.1 System information collected. 6.1.2 Physical status of domestic wiring system inspected.					
6.2 Test continuity		6.2.1 Switch OFF power to the circuit being tested. 6.2.2 Continuity tester selected. 6.2.3 Continuity of electrical wires and accessories tested.					
6.3 Test insulation		6.3.1 Switch OFF power to the circuit being tested. 6.3.2 Voltage and Ohm scale set to appropriate range. 6.3.3 All loads removed from circuit being tested. 6.3.4 All switches and MCBs turned ON. 6.3.5 Insulation tested between phase to neutral conductor. 6.3.6 Insulation tested between phase to phase conductor. 6.3.7 Insulation tested between neutral to earth. 6.3.8 Insulation tested between phase to earth.					



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6.4 Test short circuit	6.4.1 Switch OFF power to the circuit being tested. 6.4.2 Continuity tester selected. 6.4.3 Continuity of electrical wires and accessories tested.				
6.5 Test polarity	6.5.1 Main supply turned ON. 6.5.2 Polarity tested for each MCBs and switches. 6.5.3 Polarity of power socket tested.				
6.6 Test earth effectiveness	6.6.1 Voltmeter/heater connected to phase and earth wire. 6.6.2 Earth resistance tested.				

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Range Statement

Variable	Range
Physical status	<i>May include but not limited to:</i> • Damage • Breakage • Blockage • Leakage

