



DELTA STATE JOB AND WEALTH CREATION BUREAU

Governor's Office, Asaba.

ELECTRICAL INSTALLATION AND SOLAR WORKS TRAINING MANUAL

DURATION: 8 MONTHS

WEEK	DAY	TASK	ACTIVITIES (SPECIFIC ACTIONS)	METHOD
1	1	Introduction to electricity	The instructor will teach the trainees the basic definitions of electricity and its components.	Instruction
	2	Introduction to electrical installation	The instructor will teach the trainees what electrical installation is.	Instruction
	3	Generation and transmission of electricity	The instructor will teach the trainees how electricity is generated and transmitted using diagrams.	Instruction
	4	Distribution of electricity up to user's point	The instructor will teach the trainees how electricity is stepped-down and distributed to the user service point.	Instruction
	5	Identification of electricity tools, accessories, equipment, etc.	The instructor will teach the trainees how to identify tools, accessories and major equipment used in electrical installation.	Instruction
2	1	Electrical symbols	The instructor will teach the trainees the symbols used in electrical installation.	Instruction
	2	Stages in electrical installation	The instructor will teach the trainees the different stages in electrical installation.	Instruction

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	3	Identification of cables/wire sizes and application	The instructor will teach the trainees the various sizes of cables and their applications.	Instruction & practice
	4	Servicing of a consumer house	The instructor will teach the trainees how electricity is processed from an Electricity Distribution Company (BEDC) and connected to the house.	Instruction & practice
	5	Types of electrical installation (1)	The instructor will teach the trainees surface wiring.	Instruction & practice
3	1	Types of electrical installation (2)	The instructor will teach the trainees conduit wiring.	Instruction & practice
	2	Types of electrical installation (3)	The instructor will teach the trainees how to trunk wire.	Instruction & practice
	3	Wiring circuits 1	The instructor will teach the trainees how to draw different circuits of surface wiring.	Instruction & practice
	4	Wiring circuits 2	The instructor will teach the trainees how to draw different circuits of conduct wiring.	Instruction & practice
	5	Wiring circuits 3	The instructor will teach the trainees how trunking is used in an office and installation of flat screen television.	Instruction & practice
4	1	Looping	The instructor will teach the trainees what looping is in electrical wiring.	Instruction & practice
	2	The Distribution Board (DB)	The instructor will teach the trainees the function of the distribution board and their types.	Instruction & practice
	3-5	Sockets connection	The instructor will teach the trainees how sockets are connected from the distribution board and separated.	Instruction & practice

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5	1	Lighting points connection	The instructor will teach the trainees how lighting points are connected from the distribution board.	Instruction & practice
	2	Ceiling fans connections	The instructor will teach the trainees how to install ceiling fans.	Practice
	3	Wall brackets installation	The instructor will teach the trainees what wall brackets are and how to install them.	Instruction & practice
	4	Water heater installation	The instructor will teach the trainees how water heater is installed.	Instruction & practice
	5	Water pump installation	The instructor will teach the trainees the different types of water pumps and their installation.	Instruction & practice
6	1	Water pump installation (cont'd)	The instructor will teach the trainees the different types of water pumps and their installation.	Instruction & practice
	2-5	Underground piping	The instructor will teach the trainees underground piping and the installation of lighting points.	Instruction & practice
7	1	Change-over switch gears	The instructor will teach the trainees the different types of change-over switch gears.	Practice
	2	Change-over connection	The instructor will teach the trainees how to connect change-over switches.	Practice
	3	Change-over connection (2)	The instructor will teach the trainees how to connect: I. Single phase change-over II. Three phases change-over III. Knife edge change-over.	Instruction & practice
	4	Automatic change-over	The instructor will teach the trainees how to install an automatic change-over.	Instruction & practice

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	5	Circuit breaker application	The instructor will teach the trainees what circuit breakers are and their uses.	Instruction & practice
8	1-3	Use of circuit breaker in market shades, kiosk, etc.	The instructor will teach the trainees how to use circuit breaker of appropriate current rating in small structures.	Practice
	4	DB miniature circuit	The instructor will teach the trainees how to select DB circuit breaker for loading.	Practice
	5	Meter board connection 1	The instructor will teach the trainees how meter board is installed.	Instruction & practice
9	1	Meter board connection 2	The instructor will teach the trainees how electricity supply is connected to the meter board.	Instruction
	2-3	Meter board connection 3	The instructor will teach the trainees how to connect cut-out fuses (top and base).	Practice
	4	Meter board connection 4	The instructor will teach the trainees how to connect to the distribution board: I. Circuit breaker II. Earth leakage circuit breaker (ELCB).	Instruction & practice
	5	Meter board connection 5	The instructor will teach the trainees how meters and change-overs are connected.	Practice
10	1	The use of armored cables 1	The instructor will teach the trainees the different sizes of armored cables.	Practice
	2	The use of armored cables 2	The instructor will teach the trainees the use of armored cables for generator connection.	Practice
	3	Use of armored cables 3	The instructor will teach the trainees how to use armored cables for 3-phase machines/motor.	Practice

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	4	Use of armored cable	The instructor will teach the trainees how to use armored cables or recline cable to service a house.	Practice
	5	Load wires and application	The instructor will teach the trainees what load wires are, the different sizes and their applications.	Instruction & practice
11	1	Wiring of a bungalow 1	The instructor will teach the trainees the preliminaries for a bungalow wiring including feasibility study.	Instruction & practice
	2	Wiring of a bungalow 2	The instructor will teach the trainees how to determine materials required for a bungalow wiring job.	Instruction & practice
	3	Wiring of a bungalow 3	The instructor will teach the trainees how to mark points to be wired and the cracking of the building.	Practice
	4	Wiring of a bungalow 4	The instructor will teach the trainees how pipes are installed.	Instruction & practice
	5	Wiring of a bungalow 5	The instructor will teach the trainees the types and the sizes of pipes used in wiring a bungalow.	Instruction & practice
12	1	Wiring of a bungalow 6	The instructor will teach the trainees how to fix knock-out boxes, kitchen cooker unit base, etc.	Practice
	2	Wiring of a bungalow 7	The instructor will teach the trainees how to pass wires using fishing tape, bending spring, etc.	Instruction & practice
	3	Wiring of a bungalow 8	The instructor will teach the trainees how lighting points, sockets, etc are connected.	Instruction & practice
	4	Upstairs and duplex wiring stage 1	The instructor will teach the trainees feasibility studies and preliminaries steps	Practice

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			to be taken before an upstairs or duplex is wired.	
	5	Upstairs and duplex wiring stage 2	The instructor will teach the trainees the estimation of required materials for stage 1.	Practice
13	1	Upstairs and duplex wiring 3	The instructor will teach the trainees how to identify the requirements and budget of the client.	Practice
	2	Upstairs and duplex wiring 4	The instructor will teach the trainees laying of decking pipes.	Instruction & practice
	3	Upstairs and duplex wiring 5	The instructor will teach the trainees how to crack the walls downstairs to link pipes.	Practice
	4	Upstairs and duplex wiring (6)	The instructor will teach the trainees how to direct the pipes from source (laying of pipes for lighting points, sockets, water heaters, air conditioner television and close circuit television).	Practice
	5	Upstairs and duplex wiring (7)	The instructor will teach the trainees how to pass wires in an upstairs/duplex.	Practice
14	1	Upstairs and duplex wiring (8)	The instructor will teach the trainees how to connect fittings for upstairs/duplex.	Practice
	2	Upstairs and duplex wiring (9)	The instructor will teach the trainees how to connect equipment/load points.	Practice
	3	Upstairs and duplex wiring (10)	The instructor will teach the trainees how to balance load in the building.	Practice
	4	Load balancing	The instructor will teach the trainees how to avoid over-loading of a house and burning of wires/equipment.	Practice

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	5	Security light connection (1)	The instructor will teach the trainees how to determine the type of security light to use in a compound/building.	Practice
15	1	Security light connection (2)	The instructor will teach the trainees how to differentiate between halogen, Olympia and led fitting.	Practice
	2	Security light connection (3)	The instructor will teach the trainees how to connect different security lamp/fitting.	Practice
	3	Security light connection (4)	The instructor will teach the trainees how to test and okay security connections before powering them.	
	4	Installation testing (1)	The instructor will teach the trainees the checks to be carried out before installation testing.	Instruction & practice
	5	Installation testing (2)	The instructor will teach the trainees the tools used for installation testing.	Practice
16	1	Installation testing (3)	The instructor will teach the trainees how to test the installation dead with meters.	Practice
	2	Installation testing (4)	The instructor will teach the trainees how to test the installation live without load.	Practice
	3	Installation testing (5)	The instructor will teach the trainees how to test the installation with load.	Practice
	4	Field work	Field work.	Field work
	5	Meter connection	The instructor will teach the trainees how to connect meter.	Practice
17	1	Connection of single phase machine	The instructor will teach the trainees how to connect a single-phase machine.	Practice
	2	Connection of 3 phase machine	The instructor will teach the trainees how to connect a 3-phase machine.	Practice

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	3	Inverse rotation correction	The instructor will teach the trainees how to correct back rotation (inverse).	Practice
	4	Stabilizer usage (1)	The instructor will introduce the trainees to stabilizers, their various sizes and importance.	Instruction & practice
	5	Stabilizer usage (2)	The instructor will teach the trainees the uses of stabilizers for different purposes, boost supply for building, electronics etc.	Practice
18	1	Stabilizer usage (3)	The instructor will teach the trainees how to draw circuits for stabilizers connection.	Instruction & practice
	2	Field work	Field work.	Practice
	3	Appraisal (1)	The instructor will lead the trainees on a review of the activities done so far.	Review
	4	Field work	Field work.	Practice
	5	Introduction to earthing	The instructor will introduce the trainees to earthing.	Practice
19	1	Earthing	The instructor will teach the trainees how to draw a typical earthing of a building.	Practice
	2	Thunder arrestor (1)	The instructor will teach the trainees the importance of thunder arrestor in an installation.	Practice
	3	Thunder arrestor (2)	The instructor will teach the trainees the effect of not installing a thunder arrestor in a meeting.	Practice
	4	Field work	Field work	Practice
	5	Field work	Field work	Practice
20	1	Electrical circuit drawings	The instructor will teach the trainees electrical circuit drawing practical approach.	Practice

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	2	Electrical circuit symbols	The instructor will teach the trainees electrical symbols and their meaning.	Practice
	3	Television wire connections	The instructor will teach the trainees how to install television wires to a source.	Practice
	4	Testing television wiring	The instructor will teach the trainees how television wiring system can be tested.	Practice
	5	Field work	Field work.	Practice
21	1	Faults and repairs (1)	The instructor will teach the trainees how to identify faults and their repairs.	Instruction
	2	Faults and repairs (2)	The instructor will teach the trainees the common faults in electrical installation and causes.	Instruction & practice
	3	Faults and repairs (3)	The instructor will teach the trainees how faults are traced and cleared.	Practice
	4	Faults and repairs (4)	The instructor will lead the trainees in a brain storming session on faults on a typical installation and how they can be fixed.	Practice
	5	Electrical equipment faults and repairs 1	The instructor will introduce the trainees to equipment faults.	Instruction
22	1	Electrical equipment faults and repairs 2	The instructor will teach the trainees different equipment faults: - fan, kettle, water heater, toaster, electrical cooker, etc.	Instruction & practice
	2	Tools for repairs of equipment	The instructor will teach the trainees tools/instruments used for equipment repairs and how they are applied.	Instruction & practice
	3	Equipment faults and repairs case studying 1	The instructor will engage the trainees in a discussion session on practical case studies of equipment faults, diagnoses and repairs.	Practice

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	4	Equipment faults and repairs case studying 2	The instructor will have a review session with the trainees on equipment faults and repairs.	Instruction & practice
	5	Health, Safety and Environment (HSE)	The instructor will introduce the trainees to Health, Safety and Environmental (HSE) measures.	Instruction
23	1	Hazards in electrical installation and isolation	The instructor will teach the trainees the various hazards in electrical installation.	Instruction
	2	Customer's records and record-keeping	The instructor will teach the trainees how to keep records of customers and general record keeping on electrical installation.	Instruction & practice
	3	Costing and management of project	The instructor will teach the trainees how to cost a project, study a customer and manage the project.	Instruction & practice
	4	Electrical shocks	The instructor will introduce the trainees to electric shock.	Instruction
	5	Accident and causes	The instructor will teach the trainees the different types of accident and causes.	Instruction
24	1-2	Accident prevention and first aid	The instructor will teach the trainees how accidents can be prevented and introduce them to first aid.	Instruction
	3.	Safety tips in electrical installation and regulations.	The instructor will teach the trainees safety tips in electrical installation and regulations.	Instruction & practice
	4	Safety review and attitude to work	The instructor will teach the trainees what positive attitude to work is and its effect on safety, success or failure with any profession.	Instruction

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	5	Business	The instructor will teach the trainees how to set up a successful electrical installation enterprise.	Instruction
25	1	Introduction to solar works	The instructor will introduce the trainees to solar works.	Instruction
	2-3	Solar power system	The instructor will teach the trainees the components of solar power system.	Instruction
	4-5	Deep cycle batteries	The instructor will teach the trainees the different types of deep cycle batteries, rating and applications.	Instruction
26	1-5	Inverters, solar panel and solar controller	The instructor will teach the trainees how inverters; solar panels solar controllers are connected.	Instruction & practice
27	1-3	Inverter sizing and types	The instructor will teach the trainees the sizes inverter and to rate them.	Instruction & practice
	4-5	Battery sizing and types	The instructor will teach the trainees how to identify the various types of battery and their sizes as well as their ratings.	Instruction & practice
28	1-2	Panel sizes and types	The instructor will teach the trainees the types and rating of different solar panels.	Instruction & practice
	3-5	Load analysis	The instructor will teach the trainees about load and balancing the load.	Instruction & practice
29	1-2	Material sourcing	The instructor will teach the trainees how to determine materials required for a complete solar/inverter system.	Instruction & practice
	3-5	Costing and management of project	The instructor will teach the trainees how to cost a project, study a customer and manage the project.	Instruction & practice
30	1-5	Installation of a complete inverter/solar	The instructor will teach the trainees how to couple/install a complete and functional	Instruction & practice

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		powered electricity provider	inverter system using solar panels as source of energy.	
31	1-5	Trouble shooting a complete inverter/solar powered electricity provider	The instructor will teach the trainees how to check a faulty system to determine the fault of the failing component and be able to proffer solution.	Instruction & practice
32	1-2	Trouble shooting a complete inverter system	The instructor will teach the trainees how to check a faulty system to determine the fault of the failing component and be able to proffer solution.	Instruction & practice
	3-4	Field work	Field work.	Practice
	5	Review	The instructor will lead the trainees in a review of all the activities.	Discussion