



GHANA **ELECTRICAL WIRING** **REGULATION** **GUIDELINES**

30TH JULY, 2020



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PREFACE

The Electrical Wiring Guidelines for the implementation of the Electrical Wiring Regulations, 2011 (L.I.2008) has been developed and issued by the Energy Commission of Ghana to establish the framework for the certification of practitioners in the internal electrical wiring industry and enforcements of the regulations.

The Electrical Wiring Regulations, 2011 (L.I. 2008) was passed by the Parliament of Ghana into law and came into force in Feb 2012 to ensure the safety of persons, livestock and other property from hazards that arise from the presence, distribution and use of electrical energy. These hazards can arise from poor workmanship in electrical wiring, use of sub-standard and inappropriate wiring materials.

The 2020 version of the Guidelines is the second to be issued by the Commission. These Guidelines define the certification process for effective implementation and enforcement of L.I. 2008 and the Ghana Electrical Wiring Standards, GS 1009. The implementation of the Guidelines began with the certification of electricians in November 2013. Enforcement of the Regulations was piloted in 2014 in ten (10) operational districts of the distribution utilities. Subsequently there was a transition period during which partial implementation of the Regulations commenced nationwide. This allowed certified electricians to inspect, test and approve jobs undertaken by non-certified persons. The distribution utilities were also to ensure that only facilities approved by certified electricians were connected to the national Grid.

The full implementation of the Regulations was declared in October 2018. It began with the introduction of certified inspectors to inspect, test and approve jobs undertaken by certified electricians.

These Guidelines are intended for the good of the public. Users of these Guidelines are therefore highly encouraged to make submissions on any part or section of the document that needs improvement and refinement, so that the Commission can establish a veritable certification and enforcement framework in the Electrical Wiring Industry. Submission of any comments and ideas in this regard should be forwarded to:

The Executive Secretary, Energy Commission, PMB, Ministries Post Office, Accra, Ghana;
Email: info@energycom.gov.gh and telephones: (+233-302) 813756, 813762, 813763

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LIST OF ABBREVIATIONS

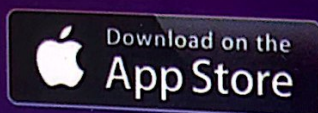
CEWI	Certified Electrical Wiring Inspector
CEWP	Certified Electrical Wiring Professional
CEWP-I	Certified Electrical Wiring Professional-Inspector
CP	Certification Package
CPD	Continuous Professional Development
DES	Designated Electrical Supervisor
EWDC	Electrical Wiring Disciplinary Committee
EWIC	Electrical Wiring Implementation Committee
EWS	Electrical Wiring Secretariat
GECA	Ghana Electrical Contractors Association
GES	Ghana Education Service
GNFS	Ghana National Fire Service
GSA	Ghana Standards Authority
ICC	Installation Completion Certificate
L.I	Legislative Instrument
LEI	Lead Electrical Inspector
PPA	Public Procurement Authority
PPE	Personal Protective Equipment
REC	Registered Electrical Contractors
TEU	Technical Examination Unit
TVED	Technical Vocation Education Division



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SECTION ONE

OVERVIEW OF THE ELECTRICAL WIRING CERTIFICATION AND REGISTRATION GUIDELINES

1.1 INTRODUCTION

These guidelines are issued this 30th July, 2020 to replace the first version of the Ghana Electrical Wiring Certification Guidelines issued on 5th February 2013 in fulfillment of the provisions of regulation 8 of the Electrical Wiring Regulations, 2011 (L.I. 2008).

1.2 BACKGROUND

The Electrical Wiring Regulations, 2011 (L.I. 2008) was passed by the Parliament of Ghana into law and entered into force on 24th February 2012. The key objectives of the Regulations are to:

- a. ensure the safety of life and property; and
- b. serve as a guide to persons who engage in internal electrical wiring and installation works.

The Electrical Wiring Regulations, 2011 (L.I. 2008) specifically provides for issues related to:

- i. who qualifies to undertake electrical wiring in Ghana (regulation 7);
- ii. how a certified qualified electrical wiring professional undertakes wiring (regulation 5);
- iii. what type of materials to be used for electrical wiring in Ghana (regulation 4);
- iv. when to conduct mandatory inspection and testing (regulation 11).

Regulation 7 provides that:

"A person shall not undertake electrical wiring on premises unless that person is certified by

- (a) *a licensed electricity distribution utility; or*
- (b) *a recognised person appointed by the Energy Commission".*

Regulation 5 (1) and (2) states that:

"5 (1) The Ghana Standards for electrical wiring set out in the Schedule, consists of the following matters:

- (a) *requirements for control and distribution of electricity on premises;*
- (b) *protective measures for safety;*
- (c) *selection and erection of equipment;*
- (d) *special installations, locations and structures;*

- (e) *inspection and testing; and shall be construed in accordance with the provisions of these Regulations.*

(2) A person shall not undertake electrical wiring on premises unless the wiring is carried out in accordance with the requirements provided in GS 1009";

Regulation 4 states that:

"A person shall not use a material for electrical wiring unless that material is capable of maintaining the integrity of an electrical equipment or installation under environmental conditions stipulated by the manufacturer of the material for electrical wiring; and approved by the Standards Authority".

Regulation 11 (3) states that:

"Periodic inspection and testing shall be carried out in accordance with the following schedule:

- (a) ten years after initial installation and use;*
- (b) every three to five years after ten years of the initial installation and use but before the expiration of thirty years; and*
- (c) every two years after thirty years of service".*

1.3 PURPOSE AND SCOPE OF THE GUIDELINES

These guidelines provide the framework for the:

- a) certification of different categories of electricians and entities engaged in electrical wiring,
- b) implementation and enforcement of the provisions of L.I. 2008.

The scope of these guidelines is in accordance with regulation 2 of L.I. 2008 and other applicable laws and shall be applied as such. This framework is applicable to:

- all entities (local or foreign) engaged in internal electrical wiring contracts within the borders of Ghana;
- subcontractors engaged to carry out internal electrical installation;
- conductors or equipment used for electrical wiring in a premise.

These Guidelines comprise the:

- Framework for the Certification of Electrical Wiring Professionals and Inspectors (Section Two to Section Seven).
- Framework for Registration of Electrical Contractors (Section Eight).

SECTION TWO

IMPLEMENTATION OF THE ELECTRICAL WIRING REGULATIONS

2.1 INTRODUCTION

Regulations 8 and 9 of L.I. 2008 mandate the Energy Commission respectively to:

- a. issue guidelines for the certification of electricians; and
- b. keep and maintain a register of electrical contractors and persons certified to undertake electrical wiring.

It is in line with the above that the Energy Commission in 2013 issued the first guidelines in accordance with the regulations.

The Energy Commission shall execute this mandate in collaboration with various stakeholders in the electrical wiring industry especially educational and training institutions.

Key among the activities to be undertaken during the implementation are the following:

- i. Certify all electrical wiring practitioners;
- ii. Register all electrical wiring Contractors;
- iii. Keep and Maintain a register of Contractors and persons certified to undertake electrical wiring;
- iv. Monitor and enforce the regulations.

2.2 IMPLEMENTING ENTITIES AND COMMITTEES

2.2.1 Electrical Wiring Secretariat (EWS)

The Energy Commission shall establish an Electrical Wiring Secretariat (EWS) which shall:

- a. ensure the effective coordination of all the above-mentioned activities.
- b. roll out the various segments of the electrical wiring programme using committees comprising members from various key stakeholder institutions.

The Energy Commission shall appoint the Head of the Secretariat to coordinate the implementation of the Regulations.

2.2.2 Committees for Implementation of the Regulations

The Energy Commission shall set up three (3) Committees to oversee specific

functional areas of the programme:

- a) Electrical Wiring Implementation Committee (EWIC);
- b) Electrical Wiring Examination and Certification Committee; and
- c) Electrical Wiring Disciplinary Committee (EWDC).

The Energy Commission reserves the right to set up other Committees. The Energy Commission shall appoint chairpersons for these Committees.

2.2.2.1 Electrical Wiring Implementation Committee

The Electrical Wiring Implementation Committee shall provide strategic direction, methods and procedures for the successful implementation of the Regulations.

Membership of the Committee shall include but not limited to the following:

- a) Energy Commission;
- b) Distribution Utilities in Ghana;
- c) Ghana National Fire Service;
- d) Public Utilities Regulatory Commission (PURC).

Representatives from other stakeholder institutions may be invited to attend Implementation Committee meetings as and when required.

The Head of the EWS shall appoint a secretary to the committee.

2.2.2.2 Electrical Wiring Examination and Certification Committee

The Electrical Wiring Examination and Certification Committee shall be responsible for the following:

- a) Examination syllabus and examination questions;
- b) Issues relating to the conduct of examination;
- c) Determination of pass mark;
- d) Granting of exemptions in examinations; and
- e) Certification of successful candidates.

The Committee shall meet before every examination (Pre-examination Meeting) and after each examination (Award Meeting)

The membership of this Committee shall be from the following:

- i. Energy Commission;
- ii. Technical and Vocational Education Division (TVED) of the Ghana Education Service (GES);
- iii. Technical Examination Unit (TEU) of the Ghana Education Service (GES);
- iv. Electrical Wiring Certification Examination Centre Examiners;
- v. Electrical Wiring Certification Examination Chief Examiner.

A representative from the EWS shall be appointed as secretary to this committee.

2.2.2.3 Electrical Wiring Disciplinary Committee

The Electrical Wiring Disciplinary Committee shall sit on all disciplinary matters pertaining to the ethics of the profession and involving the following;

- a) Certified Electrical Wiring Professionals (CEWP),
- b) Certified Electrical Wiring Inspectors (CEWI),
- c) Certified Electrical Wiring Professionals – Inspectors (CEWP-I),
- d) Registered Electrical Contractors (REC),
- e) Registered Training Institutions, and
- f) Other categories deemed necessary by the Commission.

The Committee shall apply the provisions of the Disciplinary Code to persons who violate the regulations and guidelines. It shall meet once a quarter to adjudicate over issues of alleged breaches of the Disciplinary Code.

The membership of the Electrical Wiring Disciplinary Committee shall comprise of three (3) members constituted by a;

1. senior official of the Energy Commission;
2. representative from the Attorney General's Department not below the rank of a Principal State Attorney; and
3. senior official of the distribution utility in the area a violation occurred

The Head of the EWS shall be the Secretary to the Committee.

SECTION THREE

FRAMEWORK FOR CERTIFICATION OF ELECTRICAL WIRING PROFESSIONALS AND INSPECTORS

3.1 PURPOSE

The purpose of this Framework is to:

- a) establish the requirements and procedures for the certification of Electrical Wiring Professionals and Inspectors;
- b) set basic requirements, procedures and practices to guide activities of Certified Electrical Wiring Professionals (CEWP) and ensure the enforcement of minimum standards of electrical wiring on premises in accordance with the Electrical Wiring Regulations, 2011 (L.I. 2008); and
- c) provide a regulatory direction for electrical wiring inspection and testing, set basic requirements, procedures and practices to guide the activities of Certified Inspectors and ensure the enforcement of minimum standards of internal electrical wiring on premises in accordance with the Electrical Wiring Regulations, 2011 (L.I. 2008).

3.2 BACKGROUND

Regulation 10 of the Electrical Wiring Regulations, 2011 (L.I. 2008) requires that an electricity distribution utility shall not supply electricity to a facility unless the electrical wiring or installation was undertaken by a Certified Electrician.

In addition, regulation 8 of L.I. 2008 requires that the Energy Commission issues guidelines for the certification of electricians. The Commission, under these guidelines recognises that electricians need to be trained and examined before they can be certified to undertake electrical wiring in accordance with the L.I. 2008. The activities of these practitioners shall be monitored to ensure they conform to standard electrical wiring practices.

3.3 CERTIFIED ELECTRICAL WIRING PROFESSIONAL (CEWP)

3.3.1 Who is a CEWP?

A Certified Electrical Wiring Professional (CEWP) is an electrical wiring practitioner who has been examined and certified to carry out safe electrical wiring in accordance with the Electrical Wiring Regulations, 2011 (L.I. 2008).

3.3.1.1 Categories of CEWPs

There shall be three (3) categories of CEWPs defined by their technical competencies:

- a) Domestic¹ Category;
- b) Commercial² Category; or
- c) Industrial³ Category.

a) Certified Electrical Wiring Professional – Domestic Class

These are practitioners certified to carry out wiring of premises for single-phase electricity supply connection with estimated maximum loads of eighty Amperes (80A). This category of CEWPs shall be restricted to only wiring of premises such as residential facilities, kiosks, retail shops/stores, etc.

b) Certified Electrical Wiring Professional – Commercial Class

These are practitioners certified to carry out wiring of premises for three-phase electricity supply connection with estimated minimum loads of eighty Amperes (80A) within premises. This category of CEWP shall also be qualified to undertake electrical wiring installations of premises such as residential facilities, banks, hospitals, schools, shopping malls, high rise buildings, etc.

c) Certified Electrical Wiring Professional – Industrial Class

These are practitioners certified to carry out wiring of premises for three-phase electricity supply connection to equipment used in manufacturing, assembling, etc within a factory environment. This category of CEWP shall be qualified to undertake all category of wiring. Industrial electrical wiring installations can be found in food processing, packaging, automobile assembling, etc.

The Energy Commission reserves the right to introduce other categories for distinction of roles of CEWPs.

3.3.2 Who qualifies for the CEWP?

A person who applies to be a CEWP may be a Ghanaian or a foreigner with:

- i. Formal education in an electrical engineering related discipline; or
- ii. Apprenticeship with proficiency training; and
- iii. Having successfully passed the CEWP examination.

A foreign national who intends to practice in Ghana must obtain a work permit to work in Ghana.

¹ Facilities wired for single phase supply
² Facilities wired for 3-phase supply
³ Manufacturing and processing facilities wired for 3-phase supply

3.3.3 Examination and Certification of Electrical Wiring Professionals

3.3.3.1 Registration for Examination

- a. Registration for electrical wiring certification examination shall be done using an Application Form published on the website of the Energy Commission- www.energycom.gov.gh by either
 - i. completion and submission of a printed application form to the nearest Energy Commission representative or the office of the Energy Commission, or
 - ii. completion and submission online of an Application Form on the website of the Energy Commission. The requisite documents, including the receipt of payment, shall be scanned and attached online.
- b. Candidates are required to show printed proof of payment of examination fee during submission of application.
- c. After the year 2025, all applications for certification examination shall be restricted to the online application only.

3.3.3.2 Examination Process

The Technical and Vocational Educational Division (TVED) of Ghana Education Service (GES) is the body mandated to conduct all examinations in respect of the certification of the practitioners and inspectors.

The examination process shall be in three parts as follows:

- a. Written examination;
- b. Oral examination (Interview); and
- c. Practical examination.

Candidates, except when granted exemption, are required to take all the three parts of examinations.

(a) Written Examination

The Written part of the Examination shall be based on

- i. the Ghana Standard for Electrical Wiring, GS 1009 (or amended version) and
- ii. a syllabus developed for that purpose.

(b) Oral Examination (Interview)

The Interview part of the examination shall be conducted by a panel of examiners drawn from the following:

- i. Energy Commission;
- ii. Electricity Distribution Utility within the area of the examination centre;
- iii. Ghana Standards Authority;
- iv. Ghana Institution of Engineering;

- v. Institute of Engineering and Technology;
- vi. Ghana Electrical Contractors Association;
- vii. National Vocational Training Institute;
- viii. Technical and Vocational Education Division of the Ghana Education Service;
- ix. Technical Examinations Unit of the Ghana Education Service;
- x. Technical institutions within the area of the examination centre;
- xi. Technical Universities that offer courses in Electrical Engineering.

(c) Practical Examination

The Practical Examination shall be a hands-on activity. Candidates shall perform a given practical assignment under the supervision of industry experts at any centre chosen by the Energy Commission. The assessment during the practical examination shall consider the processes and approaches used by the candidate in the execution of the task.

3.3.3.3 Certification

- a. The Energy Commission shall issue certificates of the appropriate class to successful candidates.
- b. Successful candidates shall pay for and be issued a **Certification Package (CP)** which shall include the following for their practice as CEWPs:
 - i. Installation Completion Booklet (ICB): The ICB is a booklet containing carbonated triplicate sheets of Installation Completion Certificates (ICC) used by a CEWP to record details of electrical wiring works done. The package contains three different types of the ICB – Forms A, B, and C (Minor works form) all of which contain unique serial numbers traceable to the assigned CEWP;
 - ii. Stamp: This is a stamp containing the name, a unique PIN number and certification class of the CEWP to be used for endorsement of ICC for work done by the CEWP;
 - iii. Registration Card (RC): This is a Photo Identity Card bearing the Name, Personal Identification Number (PIN), Certification Class, Date of Certification, Date of Expiry, etc of a CEWP. This Card shall be renewed after expiration in accordance with section 3.6 of these Guidelines;
 - iv. Examination Certificate: Examination Certificate of the appropriate class.

Candidates who fail to pick up their CP two (2) years after certification shall lose their certification.

3.4 CERTIFIED ELECTRICAL WIRING INSPECTORS

3.4.1 Who is a CEWI?

A Certified Electrical Wiring Inspector (CEWI) is a person who has been examined and certified to inspect, test, audit and recommend corrective measures on internal electrical wiring of new or existing facilities to ensure their compliance with all the requirements of the Electrical Wiring Regulations, 2011 (L.I.2008).

3.4.2 Who qualifies for CEWI?

Basic Qualification

To qualify to be a CEWI candidate, a person shall possess any one of the following:

- i. A CEWP Certificate with at least five (5) years' working experience in active practice of electrical wiring with evidence of at least ten duly certified electrical wiring installation works (excluding minor works and alterations) under the supervision of a CEWI;
- ii. An electrical wiring inspection and testing certificate obtained outside Ghana and issued by a recognized body with at least two (2) years working experience as an Inspector;
- iii. A Diploma or Degree in Electrical Engineering or its equivalent from a recognized Institution.

Additional Qualification

In addition to the basic qualification specified above, a prospective CEWI shall be a person who can demonstrate:

- i. Appreciation of the Electrical Wiring Regulations, 2011 (L.I. 2008),
- ii. Possession or access to tools and equipment to carry out the functions of an Inspector.

3.4.3 Examination and Certification of Electrical Wiring Inspectors

3.4.3.1 Registration for Examination

Registration for electrical wiring inspector certification examination shall be done by completion and submission online Application Form published on the website of the Energy Commission – www.energycom.gov.gh. The requisite documents including the receipt of payment shall be scanned and attached online.

3.4.3.2 Examination Process

There shall be a two-stage examination process for Inspectors consisting of:

- i. An interview/oral examination to be conducted by a panel of experts; and
- ii. A practical examination which shall require candidates to demonstrate ability to conduct inspection of internal electrical wiring of facilities and write appropriate reports on the inspection.

The examination shall be carried out in May/June and November/December.

3.4.3.3 Certification

Successful applicants shall be issued provisional certification to practice for 1-year. During this period, Provisional certificate holders would be required to undergo mandatory training approved by the Energy Commission as prerequisite for issuance of the permanent certificate. There shall be an additional practical examination prior to the issuance of the permanent certificate. Holder of a provisional certificate who passes a practical examination after attachment shall be issued with a certificate as a CEWI.

Provisional certificate holders shall be given the opportunity to attempt the practical examination twice. Failure in the examination will result in the revocation of the provisional certification as Electrical Wiring Inspector.

3.4.3.4 Validity of Registration and Renewal

A Permanent Certificate issued to a CEWI shall be valid for a period of two (2) years and may be renewed, subject to satisfactory work over the period and attendance of recommended training, under a continuous professional development programme for Inspectors.

An inspector applying for renewal of certification shall be required to submit evidence of:

1. work done for vetting; and
2. electrical instruments owned or accessible for use.

A holder of a Provisional Certificate who passes the practical examination after examination shall be issued a permanent certificate.

3.5 CERTIFIED ELECTRICAL WIRING PROFESSIONAL-INSPECTORS (CEWP-I)

3.5.1 Who is a CEWP-I?

A CEWP-I is a CEWP who is also certified to inspect, test and recommend corrective measures on internal electrical wiring of facilities for electricity service connection to ensure its compliance with all the requirements of the Electrical Wiring Regulations, 2011 (L.I. 2008).

3.5.2 Who qualifies to be a CEWP-I?

Basic Qualification

Applicant must be a CEWP who can demonstrate

- i. Appreciation of the Electrical Wiring Regulations, 2011 (L.I. 2008).
- ii. Access to adequate tools and equipment to carry out the functions of an Inspector.
- iii. Proof of at least two years' post-certification experience.
- iv. Proof of participation in mandatory training programmes scheduled by the Commission.

3.5.3 Examination and Certification of Electrical Wiring Professional - Inspectors

3.5.3.1 Registration for Examination

Registration for electrical wiring inspector certification examination shall be done by completion and submission online of an Application Form published on the website of the Energy Commission – www.energycom.gov.gh. The requisite documents including the receipt of payment of registration fee shall be scanned and attached online.

3.5.3.2 Examination Process

The examination shall be an interview/oral examination to be conducted by a panel of experts.

3.5.3.3 Validity of Registration and renewal

A Certificate issued to a CEWP-I shall be valid for two (2) years and may be renewed subject to satisfactory work over the period and attendance of recommended training under a continuous professional development programme for Inspectors.

A CEWP-I applying for renewal of certification shall be required to submit evidence of:

1. work done for vetting, and
2. electrical instruments owned or accessible for used.

Note: CEWP-Is are not allowed to conduct inspection, testing and auditing of internal electrical wiring of facilities due for the mandatory Inspection and Testing, as stated in Regulation 11(3) of L.I.2008.

3.5.4 Certification

1. The Energy Commission shall issue certificates of the appropriate class to successful candidates.
2. The successful candidates shall pay for and be issued a Certification Package (CP) which shall include the following:
 - i. The Basic Test Booklet: This is a booklet containing carbonated triplicate sheets of the Basic Test Sheet used by a CEWP-I to record details of electrical wiring inspection and testing done. The Basic Test sheet contains unique serial numbers traceable to the assigned CEWP-I;
 - ii. Stamp: This is a stamp containing the name, a unique pin number and certification class of the CEWP-I to be used for endorsement of ICC for work done by the CEWP;
 - iii. Registration Card (RC): This is a Photo Card containing all details about the CEWP, including Name, Personal Identification Number (PIN), Certification Class, Date of Certification, Date of Expiry, etc. The owner of the RC is identified as a CEWP allowed to work in Ghana for the period that the card is valid This card shall be renewed after expiration in accordance with section 3.5.3.3 of this Guideline;
 - iv. Exam Certificate: Examination Certificate of the appropriate class.

Candidates who fail to pick up their CP One (1) year after certification shall lose their certification.

The Energy Commission reserves the right to review the classifications to ensure a distinction of roles reflecting the competency of Inspectors.

3.6 CONTINUOUS PROFESSIONAL DEVELOPMENT AND RENEWAL OF CEWP CERTIFICATE

3.6.1 Continuous Professional Development (CPD)

All practitioners are required to participate in all programmes approved by the Commission. Participation in approved training programmes by a Practitioner earns CPD points and a CEWP is required to accumulate a minimum number of 60⁴ CPD points for renewal of certification upon expiry.

CEWPs may participate in training organised by recognised training institutions or COTVET certified trainers for the electrical wiring programme.

⁴

The Energy Commission reserves the right to change the minimum number of the CPD points

3.6.2 Renewal of Certification

The process of renewal of certification shall involve the submission of a completed Registration Renewal form. The Energy Commission may interview a CEWP before renewal.

SECTION FOUR

ROLES AND RESPONSIBILITIES OF ENTITIES

4.1 THE ENERGY COMMISSION

The Energy Commission shall:

- a) Coordinate the examination of practitioners in the electrical wiring industry and certify successful candidates;
- b) Monitor the activities of Registered Practitioners, Contractors and Distribution Utilities to ensure compliance with the regulations;
- c) Maintain and publish a register of all certified practitioners and contractors,

4.2 A DISTRIBUTION UTILITY

A Distribution Utility shall:

- a) ensure that only facilities wired by CEWPs in accordance with the Electrical Wiring Regulations are connected to the distribution network;
- b) Ensure that only facilities inspected and tested and passed fit by a CEWI are connected to the Distribution network.
- c) NOT provide electricity connection to a facility which is not wired by a CEWP.
- d) Keep records of facilities connected to the grid for inspection and monitoring exercise.

A Distribution Utility may engage CEWI in accordance with L.I. 2008, to inspect electrical wiring of any existing facilities within its operational Zone to determine the suitability of the facility to continue receiving supply.

4.3 CERTIFIED ELECTRICAL WIRING PROFESSIONAL

The CEWP shall:

- a) Issue a Bill of Quantities for any electrical wiring job, including labour cost and fees for inspection and testing by an Inspector after job completion. This Bill of Quantities shall be approved by the facility owner prior to commencement of work;
- b) Use only cables, switch gears and other wiring accessories approved by the Ghana Standards Authority;
- c) Carry out the electrical wiring of facilities in accordance with the Electrical Wiring Regulations;
- d) Carry out basic test on the wiring of facilities upon completion and make appropriate corrections if test proves unsatisfactory;

- e) Complete, sign and stamp the requisite Installation Completion Certificate (ICC) as in Schedules 1 to 8. (Forms A and B shall be issued for all New Service Applications and Forms A and C for Separate meter Applications)
- f) Engage a certified Inspector of the appropriate category to inspect and test the wiring and make appropriate recommendation for corrections, if any;
- g) Implement the recommendations of the CEWI;
- h) Ensure all triplicates of ICC are stamped by the Inspector who conducted the inspection and testing services for that particular job;
- i) Issue the original and second copy of ICC to facility owner to initiate electrical service connection from a Distribution Utility. The second copy is for the facility owner.
- j) NOT endorse ICCs for an electrical wiring work not conducted by him/her.

4.4 CERTIFIED ELECTRICAL WIRING INSPECTOR AND CERTIFIED ELECTRICAL WIRING PROFESSIONAL-INSPECTOR

A Certified Electrical Wiring Inspector (CEWI) or CEWP-I shall:

- a) Inspect, test and endorse all internal electrical wiring jobs carried out by a CEWP for new and existing facilities;
- b) Recommend corrections for inspected electrical wiring to remedy defects in such facilities;
- c) Effect corrective/preventive action without further authorization, if during inspection the Inspector has reasons to believe that there is some defect in the installation which may cause injury or pose a danger to people;
- d) Give approval for connection or re-connection of supply after installation has been disconnected for a period as a result of faulty or non-compliant wiring;
- e) Issue mandatory directives and notices to persons involved in electrical wiring of installations that are found to be defective;
- f) Prepare and submit quarterly inspection reports for all electrical wiring and installation inspections and tests conducted to the Energy Commission;
- g) Recommend the arrest by any Law Enforcement Agency of person(s) found to be practicing electrical wiring without certification;
- h) Report to the Commission any CEWP found in the course of the inspection to have violated the provisions of the L.I. 2008 and failed to comply with CEWI recommendation(s); and
- i) Issue the Basic Test Sheet.

NOTE

CEWP-I shall only inspect and test facilities within the scope of the CEWP category.

- a) A CEWP-I of Industrial Wiring category shall test and inspect Commercial and Domestic wiring.
- b) A CEWP-I of Commercial Wiring category shall undertake inspection and testing of Commercial and Domestic Wiring.
- c) A CEWP-I of Domestic Wiring category shall be restricted to inspection and testing of only domestic wiring.

4.5 TECHNICAL AND VOCATIONAL EDUCATION DIVISION OF THE GHANA EDUCATION SERVICE

The Technical and Vocational Education Division (TVED) of the Ghana Education Service (GES) shall be responsible for the following:

- a) **Syllabus Development** - Development of syllabus for examination of electrical wiring professionals and inspectors in conjunction with the Commission. The syllabus developed shall be reviewed periodically to conform to changing technological trends in the electrical wiring industry.
- b) **Conduct of Examination** - The Technical Examination Unit (TEU) of the Ghana Education Service (GES) shall conduct the electrical wiring certification examination which shall be coordinated by the Energy Commission. The examination shall be conducted at least once a year at selected centres in selected regions of the country.
- c) **Practical Examination Centres** -
 - a. The TVED shall identify centres to be adopted as Practical Examination Centres.
 - b. The Practical Examination shall be conducted at designated technical institutions in Ghana.
 - c. The identification of practical examination centres shall be in consultation with the Energy Commission.
- d) **Training** - Training Institutions shall be accredited by COTVET. Training Institutions registered with the Energy Commission shall be the recommended training institutions for practitioners in preparation for the certification examination.

The development and subsequent revision of all examination and training material regarding the electrical wiring programme shall be in consultation with the Energy Commission and other relevant stakeholders.

4.6 FACILITY OWNER

Facility owners shall

- i. Engage the services of a CEWP to conduct internal electrical wiring installation or implement recommendations made by an Inspector;
- ii. Ensure that they comply with the mandatory periodic inspection and testing by engaging CEWI to undertake inspection and testing of their wiring and obtain Electrical Wiring Safety Certificate for it in accordance with L.I. 2008;
- iii. Ensure that all recommended remedial works are done by a CEWP.

SECTION FIVE PROCESSES AND PROCEDURES

5.1 CERTIFIED ELECTRICAL WIRING PROFESSIONAL

5.1.1 What the Certified Electrical Wiring Professional (CEWP) must do

A Certified Electrical Wiring Professional (CEWP) shall:

- a) **Read and understand electrical wiring diagram for an installation**
CEWP shall conduct internal electrical wiring installation using an electrical wiring diagram designed by a registered electrical engineer registered with the Engineering Council. The electrician shall read and interpret the electrical wiring diagram and subsequently conduct wiring in accordance with L.I. 2008.

- b) **Undertake wiring of Facilities;**

A CEWP, upon concluding financial and other technical arrangements with a client, shall initiate wiring installation activities taking into consideration all precautionary measures to ensure the safety of life and property during and after the period of installation.

CEWP shall use only cables and accessories approved by the Ghana Standards Authority (GSA).

- c) **Test Electrical Wiring installation for integrity**

Testing shall involve the use of the requisite standard instruments to take actual electrical measurements which shall be compared to acceptable standards stipulated in GS 1009 and other relevant codes. Applicable tests shall be done in accordance with Section 9.2 of the Schedule to L.I. 2008. The values obtained from testing, when analysed shall be the basis to establish the electrical condition of an installation.

The Model, Serial numbers and date of last calibration of instruments used in testing shall be quoted in all documents and reports related to the test.

- d) **Complete the Installation Completion Certificates.**

For new or separate electricity service connection, the CEWP shall sign and stamp the Installation Completion Certificates (ICCs). The inspector of appropriate category shall countersign and stamp the ICCs, once the facility meets the standards stipulated in the schedule of L.I.2008. The Completed ICCs, with both CEWP and appropriate Inspector stamp, shall be handed over to the facility owner, individual or entity who requested the service.

Precautions shall be taken to avoid danger to persons and damage to property during wiring. Proper warning signs should be used to caution intruders and site visitors.

5.1.2 Who can authorize or request a CEWP for Installation and remedial works?

Internal electrical wiring of a facility can be carried out by a CEWP as requested by any facility owner, individual or corporate institution.

A CEWP shall at all times cooperate with the facility owner to facilitate entry and guarantee the safety of persons within the vicinity during electrical installation works.

5.1.3 Processes for electrical wiring installation

- i. A Facility owner shall engage a CEWP to undertake the electrical wiring job.
- ii. The CEWP shall request for the electrical wiring diagram for the installation and shall visit the site.
- iii. A CEWP, engaged by a facility owner shall enter into a contractual arrangement with the owner by reviewing the scope of work, bill of quantities and other terms of engagement;
- iv. A CEWP shall conduct the wiring in accordance with L.I. 2008.
- v. A CEWP shall engage a certified inspector to authenticate the integrity of the wiring.
- vi. A CEWP shall submit completed, signed and stamped ICCs to the facility owner.
- vii. A CEWP shall use only approved materials approved by the GSA for the electrical job.

5.1.4 What the Certified Electrical Wiring Professional (CEWP) must NOT do

A Certified Electrical Wiring Professional shall not

- i. Assume ownership of a job conducted by another person;
- ii. Purchase or use substandard and unapproved electrical cables and accessories.
- iii. Demand from facility owners, fees above that set for inspection and testing.

5.1.5 Fees for inspection and testing

- a) Indicative fees for the conduct of inspection and testing prior to service connection shall be established by a recognized association of CEWIs and other related bodies and approved by the Electrical Wiring Implementation Committee of the Energy Commission.

- b) Inspectors may charge below, but not above, the indicative fees.
- c) Approved Inspection and Testing Fees can be verified on the Energy Commission's website, www.energycom.gov.gh. Periodically, the Commission shall publish the Approved Inspection and Testing Fees in the National dailies.

5.1.6 Who pays a CEWP

The services of a CEWP shall be paid for by the person or entity requesting the service.

5.1.7 How to Locate a CEWP

- a) The Commission shall upload the database of all CEWPs to a mobile application. The mobile application shall contain the details of all CEWPs such as name, picture, PIN, certification class, telephone number, area of operation, among others, to enable customers secure their services.
- b) Information of CEWPs can also be accessed from the Energy Commission's website – www.energycom.gov.gh.
- c) Customers can also contact CEWPs at the offices of Certified Electrical Wiring Professional Association of Ghana, CEWPAG located in some Districts.

5.2 Certified Inspector (CEWP-I and CEWI)

5.2.1 Purpose of Inspection

The purpose of an inspection is to;

- a) verify that materials for wiring installation were appropriately selected in accordance with standards approved by the Ghana Standards Authority;
- b) verify that materials used are not defective or visibly damaged so as to eliminate the risk of accidents;
- c) verify that good workmanship/craftsmanship has been ably demonstrated in the electrical wiring work; and
- d) identify early signs of deterioration of existing installation for the necessary remedial action to be taken. (for CEWIs alone)

5.2.2 What the Certified Electrical Wiring Inspector (CEWI) must do

An Inspector shall

- a) **Inspect the materials and the general condition of the wiring installation**

The inspection shall involve a visual assessment of the electrical wiring of

a facility to check for possible electrical defects or physical defects. Inspection shall always precede testing in accordance with schedule 9.1 of the Electrical Wiring Regulations 2011 (L.I. 2008).

Inspection and testing shall be guided by a checklist (reference to the Schedule 9 of these guidelines) and also by international best practices.

b) Test the wiring for integrity

Testing shall involve the use of the requisite standard instruments to take actual electrical measurements, which shall be compared to acceptable standards stipulated in GS 1009 and other relevant codes. Applicable tests shall be done in accordance with Schedule 9.2 of L.I.2008. The values obtained from testing when analysed shall be the basis to establish the electrical condition of an installation.

The Model, Serial Number, and the last date of calibration of the instruments used in testing shall be quoted in all documents and reports related to the test.

c) Certify the Wiring as fit for use

For mandatory periodic inspection of facilities stipulated in schedule 9.3 of the Electrical Wiring Regulations, the CEWI shall sign the Electrical Wiring Safety Certificate (EWSC) to be issued by the Commission. This Certificate, which shall be boldly displayed in the facility inspected, should indicate the **date of inspection and recommended date for the next inspection**. This certificate shall be issued together with a schedule specifying some basic details of the installation and the responsibility of the facility owner between the date of issuance and the next date of inspection.

A special sticker **indicating the next inspection date** and other relevant information shall be fixed on the facility owners' meter, distribution board, or any visible portion of the electrical wiring installation by the Inspector after inspection.

d) Report in writing the entire process of inspection and testing, and recommended actions.

A CEWI shall endorse and submit a written report on every inspection undertaken with recommendations to the authorizing institution or individual. The reporting format shall include, but not be limited to the forms and checklist in the Schedule. Inspection and testing for new service connection or separate meter acquisition shall involve the CEWI

endorsing the Installation Completion Certificate of the CEWP who carried out the work and taking a copy for his/her records. An Inspection Report must include the date of the next Inspection.

In addition to the reporting above, a CEWI shall report quarterly to the Energy Commission on all inspections carried out within the period in a format determined by the Commission.

Precautions shall be taken to avoid danger to persons and damage to property and installed equipment during inspection and testing.

5.2.3 Who can authorize or request a CEWI/CEWP-I for inspection and testing?

CEWIs and CEWP-Is are individuals certified by the Commission to undertake all forms of electrical wiring inspection and testing. However, they are required to be engaged and authorized to initiate any inspection and testing activity. Inspection and testing of internal electrical wiring of a facility may be requested by the following:

- a) Facility Owner;
- b) CEWP;
- c) A Regulatory Body
- d) Distribution Utility;
- e) Ghana National Fire Service;
- f) A Court of competent jurisdiction;
- g) Law enforcement Agency.

A Certified Inspector shall at all times cooperate with the facility owner to facilitate entry and guarantee the safety of persons within the facility and vicinity during inspection and testing.

5.2.4 Procedure for Periodic Inspection and Testing of existing facility

In accordance with Regulation 11(3) of L.I.2008, there shall be periodic inspection and testing of public, commercial and industrial facilities.

The CEWI shall:

- a) Conduct the inspection and testing of the facility in accordance with the terms of engagement by the contracting parties.
- b) Submit preliminary report to the authorizing body or individual with recommendations for the remedial measures on the electrical wiring of

- the facility where necessary. The Client shall engage a CEWP to carry out the remedial measures under the supervision of the CEWI.
- c) Conduct final inspection and testing and submit the final Inspection and Testing Report to the facility owner.
 - d) Apply for Electrical Wiring Safety Certificate on behalf of the client and attach a copy of the Inspection and Testing Report to the Commission.

5.2.5 Procedure for inspection and testing for New Service Connection

In accordance with Regulation 10 (1) of L.I 2008 and section 4.2 of these guidelines, wiring undertaken by CEWPs, and inspection and testing undertaken by CEWIs/CEWP-Is shall be pre-requisite for new service connection of such facilities by any Distribution Utility. Procedurally, the following shall be adhered to

- i. the responsible CEWP shall request a CEWI/CEWP-I to conduct inspection and testing of the facility in question
- ii. The CEWI/ CEWP-I shall conduct the inspection and testing and cross-check his/her result with that conducted by the responsible CEWP who is also required by law to test the wiring before engaging a CEWI/ CEWP-I;
- iii. The CEWI/CEWP-I shall endorse and stamp all recommended Installation Completion Certificates and Basic Test Sheet covering the work;
- iv. Where the wiring is found to be unsatisfactory, the CEWI/CEWP-I shall recommend the appropriate remedial measures to be carried out by the CEWP
- v. The CEWI/ CEWP-I shall repeat the inspection and testing after the recommended remedial works have been done to ensure compliance with the Regulations before stamping and appending his signature;
- vi. The responsible CEWP shall pay the inspection and testing fee to the CEWI/CEWP-I.

5.2.6 What the Certified Inspector must NOT do

A Certified Inspector shall not:

- a) practice as a Certified Electrical Wiring Professional and carry out actual electrical wiring;
- b) inspect a job they have an interest in; and
- c) endorse an installation which they have not personally inspected.

5.2.7 Fees for inspection and testing

Indicative fees (ceiling) for conduct of Inspection and Testing prior to service connection shall be established by recognised association of Inspectors and other related bodies and approved by the Electrical Wiring Implementation Committee of the Energy Commission.

Fees for the mandatory periodic inspection and testing of existing facilities, in compliance with Regulation 11(3) of L.I. 2008, shall be negotiated and concluded by the contracting parties, i.e. the facility owner and the CEWI.

5.2.8 Who pays a CEWI/ CEWP-I

The services of a CEWI shall be paid for by the person or entity requesting the service. For mandatory inspections required by the Electrical Wiring Regulations, the Commission, as part of the enforcement shall authorize a CEWI to undertake inspection and testing in a facility that fails to comply and surcharge the facility owner with the cost of inspection.

For inspection and testing for all new connections, the CEWP who carried out the electrical wiring is required to request for the service of the CEWI to check the wiring and pay for the service of the CEWI.

SECTION SIX OFFENCES AND PENALTY

6.0 INTRODUCTION

The Commission shall obtain data of new service connections including separate meter connections from distribution utilities and perform random checks on the internal electrical wiring installation for compliance.

If the wiring is found, not compliant with the requirements of the Regulation, the CEWI/ CEWP-I who endorsed the wiring and certified the unsafe facility for service connection shall be sanctioned in accordance with the L.I 2008.

A distribution utility that connects a facility, which has no ICC endorsed by a certified inspector, shall be sanctioned.

Any facility identified to be unsafe shall be disconnected from the grid by a distribution utility or from any source of electrical energy, as stipulated by the Regulations.

6.1 OFFENCES

The following actions and behaviours shall attract corresponding appropriate sanctions spelt out in the Disciplinary Code for Electrical Wiring Programme:

6.1.1 Types of Offences - CEWP (refer to Disciplinary Code)

1. Connivance and Bribery;
2. Impersonation of another practitioner;
3. Giving out a stamp for use by another and using someone's ICC and stamp;
4. Failure to pay inspector;
5. Obstruction of inspectors from performing their duties;
6. Unlawful possession and using of another practitioners' stamp or ICC;
7. Forgery of Certificate;
8. Endorsing ICC or test sheet prior to conducting the wiring;
9. Endorsing blank ICC or test sheet prior to any test being conducted;
10. Endorsing ICC or test sheet with results other than those obtained from the prescribed test.

6.1.2 Types of Offences - CEWI/ CEWP-I (refer to Disciplinary Code)

1. Connivance and Bribery;
2. Impersonation of another practitioner;
3. Giving out a stamp for use by another and using someone's ICC and stamp;
4. Obstruction of other inspectors from performing their duties;

5. Unlawfully Possessing and using of another practitioners' stamp or ICC;
6. Forgery of Certification;
7. Endorsing blank ICC or test sheet prior to any test being conducted;
8. Endorsing ICC or test sheet of an unwired facility;
9. Endorsing ICC or test sheet with results other than those obtained from the prescribed test;
10. Endorsing a Certified Electrical Wiring Professional's work without visit to the Premises;
11. Forging and Endorsing electrical wiring audit report without carrying out audit;
12. Conducting internal wiring installation of facilities;
13. Refusing to certify work of Certified Electrical Wiring Professional without justifiable technical grounds.

6.1.3 Types of Offences – Facility Owner (refer to Disciplinary code)

1. Connivance and Bribery;
2. Engaging the services of a non-certified electrician;
3. Failure to pay for the services of a certified practitioners;
4. Obstruction of inspectors from performing their duties;
5. Forgery of Certification;

6.1.4 Types of Offences – Distribution Utility Company (refer to Disciplinary Code)

1. Connecting a facility not wired and inspected by certified practitioners to the Grid.
2. Connecting a three phase facility wired for a single-phase supply.
3. Accepting uncompleted ICCs from Clients. All ICCs must be duly completed, signed and stamped by a CEWP and Countersigned and stamped by an Inspector
4. Accepting inappropriate ICCs from clients (For new service - Form A, Form B & Basic Test Sheet. Separate Meter- Form A, Form C, and Basic Test Sheet)
5. Failure to adhere to the instruction of an Energy Commission Authorized Inspector to disconnect an unsafe facility from the Grid;
6. Connivance and Bribery;
7. Obstruction of inspectors' duties;
8. Forgery of Certification.

SECTION SEVEN MONITORING AND ENFORCEMENT

7.1 MONITORING

- a) The fundamental objective for the enactment of LI 2008 is to ensure the safety of persons, livestock and other property from hazards that arise from the use of electricity. The Commission in carrying out its mandate under these Regulations shall conduct inspections of facilities to ensure the strict compliance with standards.
- b) The Commission will monitor the activities of the CEWIs or CEWP-Is to ensure compliance to procedures and practices
- c) The Commission may also request the services of the CEWIs or CEWP-Is to enter facilities and carry out inspections on its behalf. The CEWI/ CEWP-I under the authority of the Energy Commission, may at any reasonable time, enter the facility to carry out the inspection and testing. A CEWP is required to engage a CEWI/ CEWP-I to inspect and test the work done, and endorse if satisfactory, or make recommendation for corrections where necessary.
- d) The Commission
 - i. shall obtain data of new service connection from distribution utilities to establish compliance with the regulation by the CEWI/ CEWP-I who endorsed the ICCs for New Service connection.
 - ii. shall demand for copies of ICC as well as copies of mandatory periodic inspection report for random field monitoring to ascertain compliance with the regulation and these guidelines.

In accordance with Regulation, 12 (2) of L.I.2008, a person who obstructs such a CEWI/ CEWP- in the performance of such an official function, commits an offence and is liable on summary conviction, to a fine of not more than one hundred penalty units and in the case of a continuing offence, to a further fine of Ten (10) penalty units for each day during which the offence continues after a written notice has been served on the offender by the Inspector.

- e) A **Distribution Utility** shall make ICCs available to the Commission's Inspection and Monitoring team.
- f) A **Facility Owner**, when contacted by the monitoring team shall:
 - a. provide directions to the facility to be inspected;
 - b. grant access to the monitoring team in accordance with regulation 12 of L.I. 2008 and

- c. provide all required documents requested by the Inspection and Monitoring team. Documents may include Fire Safety certificate, Installation Completion Certificate. etc

7.2 ENFORCEMENT

In accordance with regulation 11(3), the Commission shall enforce the requirement for periodic inspection and testing of the wiring of premises. This will be done in collaboration with the CEWIs, Distribution Utilities and the Ghana National Fire Service and the Facility owner.

The Commission shall collaborate with the Ghana National Fire Service to demand the Electrical Wiring Inspection Certificate as a prerequisite for the issuance of Fire Certificates.

The Commission shall also collaborate with concerned Distribution Utilities to disconnect facilities that are identified to be unsafe, until the necessary remedial actions are undertaken.

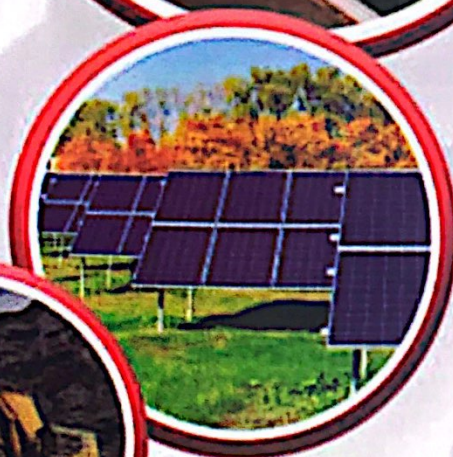
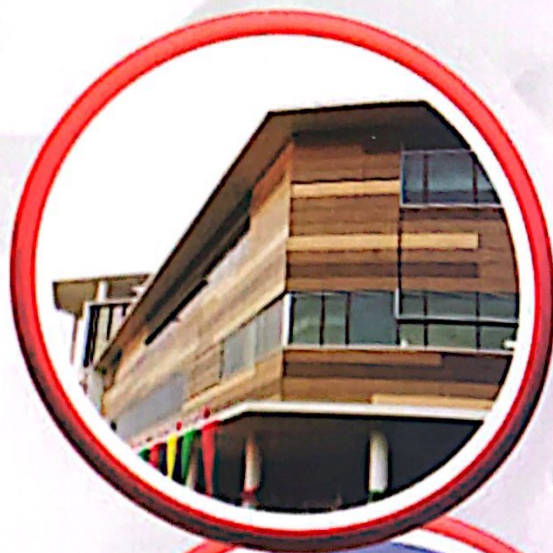
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SECTION EIGHT

FRAMEWORK FOR THE REGISTRATION OF ELECTRICAL CONTRACTORS

8.1 PURPOSE

The purpose of this Framework is to provide guidelines and procedures for the registration of Electrical Contractors in Ghana.

An Electrical Contractor in the context of this Framework is an entity registered by the Registrar General's Department to engage in internal electrical wiring installation, inspection and testing of electrical works in Ghana.

8.2 BACKGROUND

8.2.1 Provision in the Law

In accordance with regulation 9, which states that

"The Energy Commission shall keep and maintain a register of electrical contractors and persons certified to undertake electrical wiring"

the Energy Commission shall register all electrical wiring contractors who undertake internal electrical wiring installations, and also the inspection and testing of the electrical wiring of facilities.

The Energy Commission commenced certification and registration of **persons** engaged in electrical wiring under the Electrical Wiring Programme, but not **business entities** (herein referred to as Contractors) engaged in internal electrical wiring.

8.2.2 Existing Frameworks

- a) The Ghana Electrical Contractors Association (GECA) is an association of Electrical contractors practicing in Ghana. It comprises entities engaged in both internal electrical wiring and external electrical works.
- b) The Distribution Utilities issue licences to individuals and entities (contractors) engaged in external electrical works on its network.
- c) The Ministry of Works and Housing also registers electrical contractors purposely to profile them for Government Contracts. The Ministry

classifies contractors on the basis of financial capacity⁵ rather than technical capacity. External Installation Licence from ECG or Certification from Energy Commission is a pre-requisite for registration with the Ministry of Works and Housing.

8.3 REGISTERED ELECTRICAL CONTRACTORS (REC)

A Registered Electrical Contractor (REC) is an entity registered with the Energy Commission in accordance with regulation 9 of the L.I. 2008.

A REC shall ensure compliance with Energy Commission (Local Content and Local Participation) (Electricity Supply Industry) Regulations, 2017 (L.I. 2354) prior to application for registration.

8.3.1 Requirements for Registration

8.3.1.1 Application

Application for registration as a REC shall be done by completion and submission of an application form with the following Exhibits⁶

Exhibit W1 – Tax Identification Number (TIN) *A Ghana Revenue Authority approved document indicating Tax Identification Number associated with the individual or entity.*

Exhibit W2 – Document Registration: *Evidence that the applicant has registered with the Registrar General's Department. Exhibit required include*

- a. *Limited Liability Company/ Partnership/Sole Proprietor*
 - i. *Certificate of Registration*
 - ii. *Certificate to Commence Business*
 - iii. *Names, titles, nationality, addresses and telephone numbers of registered Directors and Company Secretary (where appropriate), with at least one (1) Director being a citizen of Ghana, and also one (1) Director resident in Ghana.*

Exhibit W3 – Identifiable Office: *Document(s) indicating the physical location/address of the business office which shall be verified by the Ghana Electrical Contractors Association, (GECA), Energy Commission (EC) or other association of electrical Contractors recognised by the Energy Commission*

⁵ Reference – Guidelines for the Classification and Registration of Contractors in the General Electrical and Plumbing Works);

⁶ The Commission may request further documentation from applicants for clarification. An application shall only be considered complete when all necessary documents are submitted

Exhibit W4 – Electrical Wiring Certificate of principal officers: an authentic copy of the *Electrical Wiring Certificate* or *Registration Card* of the **Designated Electrical Supervisor (DES)** or **Lead Electrical Inspector (LEI)**

Exhibit W5 – List of Assets: a list of requisite instruments, tools and other safety equipment along with proof of ownership or availability for use when needed.

Exhibit W6 – Proof of Payment of Registration fee: receipt confirming the payment of the prescribed registration fee.

Exhibit W7 – Work Permit: For foreigners, a document issued by the Ghana Immigration Service, Ministry of Interior or other relevant governmental institutions permitting the applicant to work in Ghana as an Electrical Contractor. This applies to all contracts, including sub-contract jobs.

Exhibit W8 – Local content plan: A local content plan in accordance with the Energy Commission (Local Content and Local Participation) (Electricity Supply Industry) Regulations, 2017 (L.I.2354).

Exhibit W9 – Acknowledgement of Responsibility Form (ARF) as in Schedule 10: An Acknowledgement of Responsibility Form (ARF). The ARF shall be an agreement between a DES/LEI and a REC.

8.3.1.2 Processing of application

- a) A decision on the application shall be communicated to the applicant within 60 days from the date of the last relevant submission made by the applicant.
- b) The Commission if satisfied with the application of the prospective REC, shall issue a certificate in the business name submitted in the application.
- c) Where the Commission is not satisfied, it shall inform the applicant of the reason for refusal. The applicant can resubmit its application.

8.4 VALIDITY PERIOD FOR REGISTRATION

- a) A certificate issued for the registration of a REC shall be valid for a two (2) years and shall be subject to renewal at the end of the period or be annulled.
- b) The procedure for renewal of a registration shall be the same as that applicable to the initial registration.

8.5 CLASSIFICATION OF REGISTERED ELECTRICAL CONTRACTORS

8.5.1 Registered Electrical Contractor

- a) The REC shall be a limited liability company, partnership or sole proprietor with the requisite staff to
 - i. Undertake safe internal electrical wiring under the supervision of a Designated Electrical Supervisor (DES) or
 - ii. Inspect and test internal electrical wiring of facilities with a Certified Electrical Wiring Inspector (CEWI) as Lead Electrical Inspector (LEI), in accordance with the Electrical Wiring Regulations
- b) Each REC shall show proof of ownership of the minimum stated equipment and logistical resource available to it.

8.5.2 Classification of REC

There shall be three (3) classes of RECs

- a. **REC (Limited Liability):** Contractors, registered as a limited liability company with the Registrar General's Department, and registered with the Energy Commission to undertake internal electrical wiring of Domestic, Commercial or Industrial category depending on the class of the DES.
- b. **REC (Partnership):** Contractors, registered as a Partnership with the Registrar General's Department, is registered with the Energy Commission to undertake internal electrical wiring of Domestic, Commercial or Industrial category depending on the class of the DES.
- c. **REC (Sole Proprietor):** Contractors, registered as an enterprise or sole proprietorship with the Registrar General's Department, is registered with the Energy Commission to undertake internal electrical wiring of Domestic, Commercial or Industrial category depending on the class of the DES.

8.5.3 Designated Electrical Supervisor (DES)

- a) The DES is a CEWP who has accepted the designation by a Registered Electrical Contractor to assume the responsibilities of overseeing the electrical work carried out on behalf of the REC and is duly recognized by the Commission as responsible for jobs executed by the REC.

- b) The DES shall endorse Installation Completion Certificate using their personal CEWP stamp covering jobs done by the Contracting firm.
- c) A DES shall be responsible for a maximum of five (5) CEWPs and a maximum of ten (10) apprentices/interns.
- d) The REC shall be registered to undertake any of the following activities depending on the classification or the certification class of the Designated Electrical Supervisor (DES) recognized for the registration of the REC:
 - i. Domestic Electrical Wiring;
 - ii. Commercial Electrical Wiring; or
 - iii. Industrial Electrical Wiring.

8.5.4 The Lead Electrical Inspector (LEI)

- a) The LEI is a CEWI who has accepted a designation from a Registered Electrical Contractor to assume the responsibilities of being the Lead in electrical wiring inspection and testing work carried out on behalf of the REC. The LEI will be duly recognized by the Commission as being responsible for all inspection jobs executed by the REC.
- b) The LEI takes responsibility for signing Electrical Wiring Safety Certificate issued by the Energy Commission for facilities inspected and tested by the REC.
- e) The LEI shall endorse customized Installation Completion Certificate using the personal CEWP stamp covering jobs done by the Contracting firm. **The LEI shall however, NOT endorse works undertaken by the same company that has signed him/her to be an LEI.**

Table 8.1 Sub Classification of REC

Category of REC	Minimum and Maximum Number of DES	Qualification of DES	Minimum and Maximum Number of LEI	Qualification of LEI	Minimum Instrument Requirement	Type of Registration
REC (limited Liability)	At least 1 DES	At least 1 Electrical Engineer/Corporate member of GhIE or IET and at least 1 CEWP of Domestic, Commercial or Industrial Class	Minimum of 1 CEWI as full-time employee	CEWI and holder of at least an HND in Electrical Engineering Certificate	At least 1 set of *Testing Instruments, Basic Hand tools, PPEs and First Aid Kit	A limited liability company with office verified by GECA/EC
REC (Partnership)	At least 1 DES	At least 1 Electrical Engineer/Corporate member of GhIE or IET and at least 1 CEWP Domestic, Commercial or Industrial Class	Minimum of 1 CEWI as full-time employee	CEWI and holder of at least an HND in Electrical Engineering Certificate	At least 1 set of *Testing Instruments, Basic Hand tools, PPEs and First Aid Kit	A Partnership with office verified by GECA/EC
REC (Sole Proprietor)	At Least 1 DES	At least a CEWP of Domestic, Commercial or Industrial Class	Minimum of 1 CEWI as full-time employee	CEWI and holder of at least an HND in Electrical Engineering Certificate	At least 1 set of *Testing Instruments, Basic Hand tools, PPEs and First Aid Kit	Registered Sole Proprietorship Or Enterprise with office verified by GECA/EC

**One (1) set of testing Instruments shall comprise of at least One of the following: Earth Resistance Tester, Earth Resistivity Tester, Earth Loop Impedance Tester, Insulation Resistance Tester, Clamp Ammeter and Multi Meter (Resistance, Voltage, Continuity, etc).*

One (1) set of Basic Electrical Hand tools shall comprise at least One of the following: Sets of assorted Electrical Screw drivers, assorted Electrical wrenches, Measuring tool, spirit level, hammers, chisels, fishing tape, Pliers, Side cutter, etc.

One (1) set of PPEs shall comprise at least one of the following: Safety Helmet, Eye Goggles, Hand Gloves, Safety Boots, Nose masks, safety harness, etc (Every personnel on-site must be provided with at least one set of PPEs)

One (1) set of First Aid Kit comprising of the following: Pair of scissors, Cotton wool, Iodine, Gauze, Eyewash, Bandage, Hydrogen Peroxide, Methylated Spirit. Plaster, gloves, Safety pin, Pain Killers, etc (every Site must have at least One First Aid Kit)

8.6 ROLES AND RESPONSIBILITIES OF ENTITIES

Responsibilities of entities shall include but not be limited to activities in Section 8.6. Future obligations shall be the preserve of the Energy Commission.

8.6.1 Energy Commission

The Energy Commission shall:

- a) Publish and maintain the Register of REC in both electronic and print media accessible by the general public;
- b) Ensure the compliance of REC with the Regulations and existing frameworks.

8.6.2 Registered Electrical Contractor

A Registered Electrical Contractor shall:

- a) Ensure compliance with all relevant rules and regulations governing the electrical wiring work, including safety of employees;
- b) Conduct electrical business in the name of REC with the Commission;
- c) Ensure the engagement of qualified and trained staff, including the required DES/LEI, to undertake the kind of job it has been registered to do in accordance with L.I. 2008;
- d) Make available for inspection, when required by the Commission, any record or document in his/her possession or under his/her control that the Commission considers relevant for the purpose of enforcing the L.I.2008;
- e) Quote the REC registration number on all correspondence;
- f) Notify the Commission within two weeks after the occurrence of any change in information used in the application for registration;
- g) Take immediate steps to employ a new DES in the event of loss of a DES/LEI within 60 days of occurrence;
- h) During the 60day period, REC may temporarily engage the services of another CEWP/CEWI in the company as efforts are made to employ new DES/LEI.

8.6.3 DES/LEI

- a) The Energy Commission recognises a minimum number of DES and LEI per Registered Electrical Contractor depending on the classification. The

DES or LEI oversees electrical works carried on behalf of the REC and assumes full responsibility as established in the Electrical Wiring Regulations. The Acknowledgement of Responsibility Form (ARF) shall be part of the agreement between a DES/LEI and a REC.

b) The DES or LEI shall:

- i. Complete an (ARF) in accordance with the requirements in Table 8.1 above;
- ii. Not be designated to more than one REC at a time;
- iii. Hold a CEWP/CEWI certification matching the class of the REC;
- iv. Supervise other technical staff of the REC and endorse work completed under his supervision on behalf of the REC;
- v. Ensure that all electricians under supervision carry out their work safely and in compliance with the provisions in the L.I.2008.

8.7 RETENTION OF DES AND LEI

- a. A REC shall retain a DES/LEI indicated at the time of registration.
- b. In the event of revocation of certification, dismissal, departure of DES/LEI or any other circumstance resulting in a vacant position, the following processes shall be followed to replace the DES/LEI:
 - i. The REC shall notify the Commission in writing of the vacant position within 14 days, stating the reason for the occurrence of the vacant position;
 - ii. The Commission if satisfied with the reason, shall give the REC Sixty (60) working days from the date of occurrence to employ or assign a new DES/LEI;
- c. Within the Sixty (60) days period, a REC is allowed to engage a CEWP / CEWI on short term basis to supervise or lead in all electrical works it is engaged in and such engaged DES/LEI can sign off using their personal stamps on ICC of the REC.
- d. After the Sixty (60) days period, the REC will be delisted in a situation where a replacement is not appointed.
- e. The status of the REC shall not be restored unless the adequate number of DES/LEI has been engaged.

8.8 IMPLEMENTATION OF THE FRAMEWORK

8.8.1 Requirement to Register as REC

- a) Any entity engaged in or intending to engage in internal electrical wiring contracting work within the scope of the Electrical Wiring Regulations, 2011 (L.I. 2008), shall be required to register with the Energy Commission as a REC.
- b) The Commission shall keep an updated register of REC and make it available on its website and other official communication channels of the Commission.

8.8.2 Collaboration with Ministry of Works and Housing

The Commission shall collaborate with the Ministry of Works and Housing to ensure that the REC is a requirement for their classification of electrical contractors for Government Contracts.

8.8.3 Public Procurement Authority (PPA)

The Commission shall collaborate with the Public Procurement Authority to ensure that only RECs are allowed to tender for public/government jobs related to internal electrical wiring.

8.8.4 Members of Recognized Electrical Contractors Associations

Electrical contracting firms who are members of any association of electrical contractors recognized by the Energy Commission (such as GECA) may be acknowledged as such.

8.9 OFFENCES AND SANCTIONS

- a) Registered Electrical Contractors, as well as DES and LEI, are expected to comply with the provisions of these guidelines as well as the Electrical Wiring Regulations. Any action contrary shall be considered a violation and shall attract appropriate sanctions.
- b) Violations by REC shall include, but not be limited to, the underlisted and shall attract corresponding appropriate sanctions spelt out in the Disciplinary Code for Electrical Wiring Programme:

1. using unauthorized persons to carry out an activity that requires certification or license;
2. providing inaccurate information for Registration such as the employment status of the DES/LEI.

DEFINITIONS

1. **Certified Electrical Wiring Inspector Certified Electrical Wiring Inspectors (CEWI):** A Certified Electrical Wiring Inspector is a person certified by the Energy Commission to inspect, test, audit and recommend corrective measures on internal electrical wiring of new or existing facilities to ensure its compliance with all the requirements of the Electrical Wiring Regulations, 2011 (L.I.2008).
2. **Certified Electrical Wiring Professional (CEWP):** Certified Electrical Wiring Professionals (CEWP): A Certified Electrical Wiring Professional is an electrical wiring practitioner who has been examined and certified to legally carry out safe electrical wiring in accordance with the Electrical Wiring Regulations, 2011 (L.I. 2008).
3. **Certified Electrical Wiring Professional-Inspector (CEWP-I):** Certified Electrical Wiring Professional-Inspector (CEWP-I): A CEWP-I is a CEWP who has gone through an oral examination and is certified to inspect, test and recommend corrective measures on internal electrical wiring of facilities for electricity service connection to ensure its compliance with all the requirements of the Electrical Wiring Regulations, 2011 (L.I.2008).
4. **Certification Package: Certification Package (CP):** A certification package is an official document given to a CEWP which includes a Stamp, ICCs, Registration Card and Exams Certificate.
5. **Continuous Professional Development (CPD):** The ongoing process of developing, maintaining and documenting your professional skills. These skills will be gained formally, through courses or training organised by the Energy Commission.
6. **Designated Electrical Supervisor (DES):** Designated Electrical Supervisor (DES): A DES is a CEWP who has accepted the designation by a Registered Electrical Contractor to assume the responsibilities of overseeing the electrical work carried out on behalf of the Contractor and duly recognized by the Commission. The DES shall endorse Installation Completion Certificate (ICC) using their personal CEWP stamp covering jobs done by the Contracting firm.
7. **Electrical Wiring Disciplinary Committee (EWDC):** Electrical Wiring Disciplinary Committee (EWDC): The Electrical Wiring Disciplinary

Committee sits on all disciplinary matters pertaining to the ethics of the profession involving; Certified Electrical Wiring Professionals (CEWP), Certified Electrical Wiring Inspectors (CEWI) Registered Electrical Contractors (REC), Registered Training Institutions (RTI)

8. **Electrical Wiring Implementation Committee (EWIC):** Electrical Wiring Implementation Committee provides strategic direction for rolling out various modules for the successful implementation of the Regulations.
9. **Electrical Wiring Secretariat (EWS):** The Electrical Wiring Secretariat (EWS) is a Unit set up by the Energy Commission to ensure the effective implementation of the Electrical Wiring Regulations. The Secretariat is to roll out the various segments of the Electrical Wiring Programme using committees comprising members from various key stakeholder institutions.
10. **Ghana Electrical Contractors Association GECA:** GECA membership is exclusively made up of businesses from across the building services and the engineering sector that are involved with the design, installation and maintenance of electrical and electro technical systems. GECA member companies are certified by the GECA.
11. **Ghana Education Service (GES):** The GES is a government agency under the ministry of education responsible for implementing government policies that ensure that Ghanaians of school going age receive quality formal education. The GES oversees basic education, senior higher education, technical education and special education.
12. **Ghana National Fire Service (GNFS):** The Ghana national fire service is committed to providing and efficient and valued fire and rescue services to prevent and manage undesired fires, thereby reducing loss of life and properties by enforcement fire safety measures in national strategic installations and respond promptly to fire disasters
13. **Ghana Standards Authority (GSA):** The Ghana standard authority is the statutory body responsible for the management of nation's quality infrastructure embracing the three pillars of metrology, standardisation and conformity assessment (i.e. testing, inspection and certification)

14. **Installation Completion Certificate (ICC):** It is used by a CEWP to record details of electrical wiring works done.
15. **Legislative Instrument (L.I):** The 1992 Constitution classifies subsidiary legislation as part of the laws of Ghana. Section 4 of the Statutory Instrument Act, 1959, as amended, defines a legislative instrument as a statutory instrument declared by the Attorney-General to be legislative in character.
16. **Lead Electrical Inspector (LEI):** A LEI is a CEWI who has accepted a designation from Registered Electrical Contractor (REC) to assume the responsibilities of being the Lead in electrical wiring inspection and testing work carried out on behalf of the REC. The LEI will be duly recognized by the Commission as being responsible for all inspection jobs executed by the REC-IT.
17. **Public Procurement Authority (PPA):** The PPA is established by the Public Procurement Act, 2003 (Act 663) as a regulatory body responsible for the effective implementation of the Public Procurement Law in Ghana.
18. **Personal Protective Equipment (PPE):** PPE is protective clothing, helmets, goggles, other garment or equipment designed to protect the wearers' body from injuries or infection reducing exposure to hazards in the work environment.
19. **Registered Electrical Contractors (REC):** An entity registered with the Energy Commission in accordance with regulation 9 of the L.I. 2008.
20. **Technical Examination Unit (TEU):** The TEU is mandated to conduct technical examinations at the craft, advanced craft, technician and diploma levels in Ghana. The unit conducts and awards certificates for technical education institutions in the country
21. **Technical Vocational Education Division (TVED):** A division in the GES that is responsible for the implementation of pre-tertiary technical and vocational education under the ministry of education.



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SCHEDULES

SCHEDULE 1

DETAILS OF THE CLIENT	
INSTALLATION ADDRESS	
DESCRIPTION AND EXTENT OF THE INSTALLATION (Tick boxes as appropriate) Description of Installation: Extent of installation covered by this Certificate: (Use continuation sheet if necessary) see continuation sheet No:	New installation <input type="checkbox"/> Addition to an existing installation <input type="checkbox"/> Alteration to an Existing installation <input type="checkbox"/>
FOR DESIGN I/We being the person(s) responsible for the design of the electrical installation (as indicated by my/our signature below), particulars of which are described above, have exercised reasonable skill and care when carrying out the design hereby CERTIFY that the design work for which I/we have been responsible is to the best of my/our knowledge and belief in accordance with the Electrical Wiring Regulations The extent of liability of the signatory or the signatories is limited to the work described above as the subject of this Certificate For the DESIGN of the installation: ** (Where there is mutual responsibility for the design) Signature: Date: Name (IN BLOCK LETTERS): Designer No 1 Signature: Date: Name (IN BLOCK LETTERS): Designer No 2**	
FOR CONSTRUCTION I/We being the person(s) responsible for the construction of the electrical installation (as indicated by my/our signature below), particulars of which are described above, have exercised reasonable skill and care when carrying out the construction hereby CERTIFY that the construction work for which I/we have been responsible is to the best of my/our knowledge and belief in accordance with the Electrical Wiring Regulations The extent of liability of the signatory or the signatories is limited to the work described above as the subject of this Certificate For CONSTRUCTION of the installation: Signature: Date: Name (IN BLOCK LETTERS): Constructor	
FOR INSPECTION AND TESTING I/We being the person(s) responsible for the inspection and testing of the electrical installation (as indicated by my/our signature below), particulars of which are	

described above, have exercised reasonable skill and care when carrying out the inspection and testing hereby CERTIFY that the work for which I/we have been responsible is to the best of my/our knowledge and belief in accordance with the Electrical Wiring Regulations.

The extent of liability of the signatory or the signatories is limited to the work described above as the subject of this Certificate

For INSPECTION AND TESTING of the installation:

Signature: Date: Name (IN BLOCK LETTERS):

Inspector

NEXT INSPECTION

I/We the designer(s), recommend that this installation is further inspected and tested after the interval of not more than years/months

ELECTRICAL INSTALLATION CERTIFICATE (FORM A)

PARTICULARS OF SIGNATORIES TO THE ELECTRICAL INSTALLATION CERTIFICATE									
Designer (No 1) Name: Company: Location: Postal address: Tel No:									
Designer (No 2) (if applicable) Name: Company: Location: Postal address: Tel No:									
Constructor Name: Company: Location: Postal address: Tel No:									
Inspector Name: Company: Location: Postal address: Tel No:									
SUPPLY CHARACTERISTICS AND EARTHING ARRANGEMENTS Tick boxes and enter details as appropriate									
Earthing Arrangements TN-C <input type="checkbox"/> TN-S <input type="checkbox"/> TN-C-S <input type="checkbox"/> TT <input type="checkbox"/> Alternative source of supply (to be detailed on attached schedules) <input type="checkbox"/>	Number and type of Live Conductors a.c. d.c. 1 -phase, 2 wire <input type="checkbox"/> 2 -pole <input type="checkbox"/> 2 -phase, 3 wire <input type="checkbox"/> 3 -pole <input type="checkbox"/> 3 -phase, 3 wire <input type="checkbox"/> Other <input type="checkbox"/> 3 -phase, 4 wire <input type="checkbox"/> <input type="checkbox"/>	Nature of Supply Parameter Nominal voltage, U/U_o ⁽¹⁾ V Nominal frequency, f ⁽¹⁾ Hz Prospective fault current, I_{pf} ⁽²⁾ kA External loop impedance, Z_o ⁽²⁾ Ω <i>(Note: (1) by enquiry, (2) by enquiry or by measurement)</i>	Supply Protective Device Characteristics Type: Nominal current rating A						
PARTICULARS OF INSTALLATION REFERRED TO IN THE CERTIFICATE Tick boxes and enter details as appropriate									
Means of Earthing Supplier's facility <input type="checkbox"/> Installation earth Electrode <input type="checkbox"/>	Maximum Demand Maximum demand (load) Amps Details of Installation Earth Electrode (where applicable) <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Type</td> <td style="width: 33%;">Location</td> <td style="width: 33%;">Electrode resistance to earth (e.g. rod(s), tape, etc)</td> </tr> <tr> <td colspan="3" style="border: none;">..... Ω</td> </tr> </table>			Type	Location	Electrode resistance to earth (e.g. rod(s), tape, etc) Ω		
Type	Location	Electrode resistance to earth (e.g. rod(s), tape, etc)							
..... Ω									
Main Protective Conductors Earthing conductor: material csa connection verified <input type="checkbox"/> Main equipotential bonding conductors material csa connection verified <input type="checkbox"/> To incoming water and/or gas service To other elements:									

Main Switch or Circuit-breaker	
GS, Type and No. of poles	Current rating A Voltage rating V
Location	Fuse rating or setting A
Rated residual operating current $I_{\Delta n}$ mA, and operating time ofms (at $I_{\Delta n}$)	
<small>(applicable only where an RCD is suitable and is used as a main circuit breaker)</small>	
COMMENTS ON EXISTING INSTALLATION (in the case of an alteration or addition see Regulation 743-01-04):	
.....	
.....	
.....	
SCHEDULES	
The attached Inspection and Test Result Schedules are part of this document and this Certificate is only valid when Test Result Schedules are attached to it.	
..... Inspection Schedules andTest Result Schedules are attached. (Enter quantities of schedules attached)	

SCHEDULE 2

**SCHEDULE 3 MINOR ELECTRICAL INSTALLATION WORKS CERTIFICATE
(REQUIREMENTS FOR ELECTRICAL WIRING REGULATIONS)**

To be used only for minor electrical work which does not include the provision of a new circuit

PART 1 : Description of minor works 1. Description of the minor works 2. Location/Address 3. Date of minor works completed	
PART 2 : Installation details 1. System earthing arrangement (where known) TN-C-S <input type="checkbox"/> TN-S <input type="checkbox"/> TT <input type="checkbox"/> 2. Method of protection against indirect contact 3. Protective device for the modified circuit Type Rating A	
PART 3 : Essential Tests Earth continuity satisfactory <input type="checkbox"/> Insulation resistance: Phase/neutral..... M Ω Phase/earth M Ω Neutral/earth M Ω Earth fault loop impedance..... Ω Polarity satisfactory <input type="checkbox"/> RCD operation (if applicable). Rated residual operating current $I_{\Delta n}$ mA and operating time ofms (at $I_{\Delta n}$)	
PART 4 : Declaration I/We CERTIFY that the said works do not impair the safety of the existing installation, that the said works have been designed, constructed, inspected and tested in accordance with the Electrical Wiring Regulations and that the said works, to be the best of my/our knowledge and belief, at the time of my/our inspection complied with the Electrical Wiring Regulations except as detailed in Part 2.	
Name: For and on behalf of: Address:	Signature: Position: Date:

SCHEDULE 4

Schedule of Installation Methods of Cables (Including Reference Method) (Form B)

**PERIODIC INSPECTION REPORT FOR AN ELECTRICAL INSTALLATION
(REQUIREMENTS FOR ELECTRICAL WIRING REGULATIONS)****DETAILS OF THE CLIENT**

Client:

Address:

Purpose for which this Report is required:

DETAILS OF THE INSTALLATION (Tick boxes as appropriate)

Occupier:

Installation:

Address:

Description of Premises: Domestic ☐ Commercial ☐ Industrial ☐ Other ☐

Estimated age of the Electrical Installation:years

Evidence of Alterations or additions: Yes ☐ No ☐ Not apparent ☐

If "Yes", estimate age: years

Date of last inspection: Records available: Yes ☐ No ☐**EXTENT AND LIMITATION OF THE INSPECTION**

Extent of electrical installation covered by this report:

Limitations:

This inspection has been carried out in accordance with the Electrical Wiring Regulations. Cables concealed within trunking and conduits, or cables and conduits concealed under floors, in roof spaces and generally within the fabric of the building or underground have not been inspected.

NEXT INSPECTION

I/We recommend that this installation is further inspected and tested after an interval of not more than months/years, provided that any observations 'requiring urgent attention' are attended to without delay.

DECLARATION**INSPECTED AND TESTED BY**

Name:

Signature:

For and on behalf of:

Position:

Address:

Date:

SUPPLY CHARACTERISTICS AND EARTHING ARRANGEMENTS <small>Tick boxes and enter details, as appropriate</small>												
Earthing Arrangements <hr/> TN-C <input type="checkbox"/> TN-S <input type="checkbox"/> TN-C-S <input type="checkbox"/> TT <input type="checkbox"/> Alternative source of supply (to be detailed on attached schedules) <input type="checkbox"/>	Number and type of Live Conductors <hr/> a.c. <input type="checkbox"/> d.c. <input type="checkbox"/> 1 -phase, 2 wire <input type="checkbox"/> 2 -pole <input type="checkbox"/> 2 -phase, 3 wire <input type="checkbox"/> 3 -pole <input type="checkbox"/> 3 -phase, 3 wire <input type="checkbox"/> Other <input type="checkbox"/> 3 -phase, 4 wire <input type="checkbox"/>	Nature of Supply Parameter <hr/> Nominal voltage, U/U_o ⁽¹⁾ V Nominal frequency, f ⁽¹⁾ Hz Prospective fault current, I_{pr} ⁽²⁾ kA External loop impedance, Z_o ⁽²⁾ Ω <i>(Note: (1) by enquiry, (2) by enquiry or by measurement)</i>	Supply Protective Device Characteristics <hr/> Type: Nominal current rating A									
PARTICULARS OF INSTALLATION REFERRED TO IN THE REPORT <small>Tick boxes and enter details, as appropriate</small>												
Means of Earthing Suppliers facility <input type="checkbox"/> Installation earth electrode <input type="checkbox"/>	<table border="0" style="width: 100%;"> <tr> <th style="width: 30%;">Type</th> <th style="width: 30%;">Details of Installation Earth Electrode (where applicable)</th> <th style="width: 40%;">Location</th> </tr> <tr> <td></td> <td>Electrode resistance (e.g. rod(s), tape, etc) to earth</td> <td></td> </tr> <tr> <td>.....</td> <td>..... Ω</td> <td>.....</td> </tr> </table>			Type	Details of Installation Earth Electrode (where applicable)	Location		Electrode resistance (e.g. rod(s), tape, etc) to earth	 Ω
Type	Details of Installation Earth Electrode (where applicable)	Location										
	Electrode resistance (e.g. rod(s), tape, etc) to earth											
..... Ω										
Earthing conductor: Main Protective Conductors material csa												
Main equipotential bonding conductors material csa												
To incoming water service <input type="checkbox"/> To incoming gas service <input type="checkbox"/> To incoming oil service <input type="checkbox"/> To structural steel <input type="checkbox"/>												
To lightning protection <input type="checkbox"/> to other incoming service(s) <input type="checkbox"/> (state details)												
Main Switch or Circuit-breaker Main Switch or Circuit-breaker												
GS, Type and No. of poles Current rating A Voltage rating V												
Location Fuse rating or setting A												
Rated residual operating current $I_{\Delta n}$ mA, and operating time of ms (at $I_{\Delta n}$) <small>(applicable only where an RCD is suitable and is used as a main circuit breaker)</small>												

OBSERVATIONS AND RECOMMENDATIONS Tick boxes as appropriate

Recommendations as detailed below

Referring to the attached Schedule(s) of Inspection and Test Results, and subject to the limitations specified at the

Extent and Limitations of the Inspection section

☐ No remedial work is required ☐ The following observations are made

.....

.....

.....

.....

.....

One of the following numbers, as appropriate, is to be allocated to each of the observations made above to indicate to the person(s) responsible for the installation the action recommended.

☐ 1 requires urgent attention ☐ 2 requires improvement ☐ 3 requires further investigation

☐ 4 does not comply with the Regulations. This does not imply that the electrical installation inspected is unsafe.

SUMMARY OF THE INSPECTION

Date(s) of the inspection:

.....

General condition of the installation:

.....

Overall assessment: Satisfactory/Unsatisfactory

SCHEDULE(S)

The attached Inspection and Test Result Schedules are part of this document and this Report is only valid when Test Result Schedules are attached to it.

..... Inspection Schedules and..... Test Result Schedules are attached
(Enter quantities of schedules attached)



SCHEDULE 7

--	--	--	--	--	--	--	--	--	--

PARTICULARS OF SIGNATORIES TO THE SOLAR ELECTRICAL INSTALLATION CERTIFICATE

Designer (No 1)

Name: Company:

Location:

Postal address: Tel No:

Designer (No 2)

Name: Company:

Location:

Postal address: Tel No:

CEI-SPVI

Name: Company:

Location:

Postal address: Tel No:

Inspector

Name: Company:

Location:

☐ Postal address: Tel No:

SOLAR INSTALLATION ARRANGEMENTS Tick boxes and enter details as appropriate

PV ARRAY

Capacity of PV

Array:.....

Number of modules in

series:.....

Number of modules in

parallel:.....

Total number of

modules:.....

Module

Type:.....

Module

Efficiency:.....

NUMBER AND TYPE OF
LIVE CONDUCTORSSTAND ALONE ☐GRID INTERACTIVE ☐a.c. ☐ d.c. ☐1 -phase, 2 wire ☐ 2 -pole ☐2 -phase, 3 wire ☐ 3 -pole ☐3 -phase, 3 wire ☐ Other ☐3 -phase, 4 wire ☐NATURE OF SUPPLY
PARAMETERNominal voltage, $U/U_o^{(1)}$ VNominal frequency, $f^{(1)}$ Hz

Prospective fault

current, $I_{pf}^{(2)}$ kA

External loop

impedance, $Z_o^{(2)}$ Ω (Note: by enquiry or by
measurement)LOAD
ESTIMATI
ONEstimated Dc
Load

.....kW

Estimated Ac
Load

.....kW

Total Load
Estimated.....Total
Estimated
Energy
KWh/day

PARTICULARS OF INSTALLATION REFERRED TO IN THE CERTIFICATE Tick boxes and enter details as appropriate

Means of Earthing

Supplier's facility ☐Installation earth
Electrode ☐

Maximum Inverter Capacity

Maximum Capacity (load) KW

Inverter Efficiency:.....

Number of inverters:.....

Controller/Charger: (where applicable)

	Type:.....Maximum output [A]:..... Maximum power [W]:..... Temperature compensation:..... Efficiency [%]:.....
<p style="text-align: center;">Battery Bank</p> Battery Bank Capacity:..... Number of batteries connected in series:..... Number batteries connected in parallel:..... Total number of batteries required:..... Battery type:..... Battery size:.....	
<p style="text-align: center;">Main Switch or Circuit-breaker</p> GS, Type and No. of poles Current rating A Voltage rating V Location Fuse rating or setting A Rated residual operating current $I_{\Delta n}$ mA, and operating time ofms (at $I_{\Delta n}$) (applicable only where an RCD is suitable and is used as a main circuit breaker)	
<p>COMMENTS ON EXISTING INSTALLATION (in the case of an alteration or addition see Regulation 743-01-04):</p>	
<p>SCHEDULES</p> <p>The attached Inspection and Test Result Schedules are part of this document and this Certificate is only valid when Test Result Schedules are attached to it.</p> <p>..... Inspection Schedules andTest Result Schedules are attached. (Enter quantities of schedules attached)</p>	

0071520

Customer Name:

..Facility Location/GPS Address:

Description of Premises: Domestic ☐

District/Station (NEDCO / ECG / EPC)

Ref. No.: Location:

A

Test Failed

MA

.....mA

1

.....

1

Earth fault Loop Impedance: Ω

Earth Electrode Resistance: Ω

[illegible]

SCHEDULE 9
INSPECTION AND TESTING CHECKLIST

METRE BOARD

1. ☐ SIZE OF CABLES AT METRE BOARD
2. ☐ COLOUR CODE OF CABLES AT METRE BOARD
3. ☐ PHYSICAL CONDITION OF CABLES AT METRE BOARD
- ☐ LOCATION OF METRE BOARD

DISTRIBUTION BOARD (DP)WAY;AV

1. ☐ PHYSICAL CONDITION OF DP
 2. ☐ PHYSICAL CONDITION OF INCOMMER
 3. ☐ PHYSICAL CONDITION OF BREAKERS
 4. ☐ TERMINATION & SIZE OF MAIN SUPPLY CABLE TO
 - a. ☐ DP
 - b. ☐ CHANGE OVER
 5. ☐ TERMINATION & SIZE OF LIGHTING CIRCUITS
 6. ☐ TERMINATION & SIZE OF 13A POWER CIRCUIT
 7. ☐ TERMINATION & SIZE OF A/C CIRCUITS
 8. ☐ TERMINATION & SIZE OF WATER HEATER CIRCUITS
 9. ☐ TERMINATION & SIZE OF COOKER UNIT CIRCUIT
 10. ☐ TERMINATION & SIZE OF OTHER CIRCUITS
 11. ☐ TERMINATION & SIZE OF MAIN INCOMING NEUTRAL LINE
 12. ☐ TERMINATION & SIZE OF CIRCUIT NEUTRAL LINES
 13. ☐ TERMINATION & SIZE OF EARTH CONDUCTOR
 14. ☐ TERMINATION & SIZE OF CIRCUIT PROTECTIVE CONDUCTORS (CPC)
 15. ☐ CONDITION OF NUETRAL BAR
 16. ☐ CONDITION OF EARTH BAR
 17. ☐ LABELING OF ALL CIRCUITS IN DP INCLUDING SPARES
 18. ☐ ALLOWANCE ON CABLES
 19. ☐ GENERAL ROUTING OF CABLES IN DP
 20. ☐ OLD COLOUR CODING
 21. ☐ LOCATION OF DP
 22. ☐
- ☐ NEW COLOUR CODING

SOCKET OUTLETS (13A, 15A, ETC)

1. ☐ PHYSICAL CONDITION OF SOCKET
2. ☐ CONDITION AND THREAD OF SOCKET SCREWS
3. ☐ CONDITION OF CONDUIT BOX
4. ☐ TERMINATION OF LIVE CABLE
5. ☐ TERMINATION OF NEUTRAL CABLE
6. ☐ TERMINATION OF CPC (EARTH CABLE)
7. ☐ ALLOWANCE OF CABLES

REPEAT 1-7 FOR EVERY SOCKET**SWITCHES (LIGHT, A/C, HEATERS, COOKER ETC)**

1. ☐ PHYSICAL CONDITION OF SOCKET
2. ☐ CONDITION AND THREAD OF SOCKET SCREWS
3. ☐ CONDITION OF CONDUIT BOX
4. ☐ TERMINATION OF LIVE CABLE
5. ☐ TERMINATION OF SWITCH CABLE
6. ☐ CONDITION OF CONTROL CABLES (INTERMEDIATE SWITCHES)
7. ☐ ALLOWANCE OF CABLES
8. ☐ CONDITION OF PILOT LIGHT

PIPING

1. ☐ SIZE OF CONDUIT PIPES
2. ☐ CONDITION OF PIPE CONNECTION JOINTS
3. ☐ BENDS OF CONDUIT PIPES
4. ☐ JOINTS BETWEEN CIRCULAR BOXES AND CONDUIT PIPES
5. ☐ CIRCULAR BOXES COVER AND SCREWS
6. ☐ CONDITION OF CABLES IN CIRCULAR BOXES

EARTH

1. ☐ EARTH CHAMBER LOCATION
2. ☐ EARTH CHAMBER LID
3. ☐ CONNECTION BETWEEN EARTH CONDUCTOR AND EARTH ROD/MAT/PLATE
4. ☐ EARTH TREATMENT MATERIAL (NO SALT)

RESIDUAL CURRENT DEVICE (RCD)AmA

1. ☐ TERMINATION AT RCD
2. ☐ PHYSICAL CONDITION OF RCD
3. ☐ LOCATION OF RCD

TESTING**(A) CONTINUITY**

1. ☐ CONTINUITY BETWEEN CABLE END AND RESPECTIVE SOCKET OR SWITCH (Ω)
2. ☐ CONTINUITY BETWEEN EVERY SWITCH AND LIGHT, A/C, HEATER, COOKER UNIT, SHAVER UNIT, DOORBELL ETC. (Ω)
3. ☐ CONTINUITY OF MAINS CABLE TO
 - a. ☐ DP (LIVE AND NEUTRAL) (Ω)
 - b. ☐ CHANGE OVER (Ω)
4. ☐ CONTINUITY OF EARTH CONDUCTOR TO EARTH ROD (Ω)

(B) INSULATION RESISTANCE (IR) TESTS

1. ☐ IR TEST BETWEEN EVERY LINE AND RESPECTIVE NUETRAL ($M\Omega$)
2. ☐ IR TEST BETWEEN EVERY NUETRAL AND RESPECTIVE EARTH ($M\Omega$)
3. ☐ IR TEST BETWEEN EVERY LINE AND RESPECTIVE EARTH ($M\Omega$)

ALL CIRCUITS SHOULD HAVE EARTH CABLE (CPC) INCLUDING LIGHTING CIRCUITS

(C) POLARITY TEST

1. ☐ AT ALL SOCKET OUT LETS
2. ☐ AT ALL SWITCHES
3. ☐ AT ALL FIXTURES/FITTINGS including lights
4. ☐ AT METER BOARD
5. ☐ AT CHANGE OVER
6. ☐ AT DP

7. EARTH ROD RESISTANCE TO EARTH TEST

1. ☐ RESISTANCE

8. RESIDUAL CURRENT DEVICE TEST

- a. ☐ RESIDUAL CURRENT TRIP TEST
- b. ☐ TRIP DURATION

SCHEDULE 10
ACKNOWLEDGEMENT OF RESPONSIBILITY FORM (ARF)
 (For electrical contractors and CEWPs, CEWI)

DETAILS OF CEWP/ DES/ LEI	
NAME	
CERTIFICATION CLASS	
DATE OF CONTRACT COMMENCEMENT WITH REC	

DETAILS OF REGISTERED CONTRACTING COMPANY (REC)	
REGISTERED COMPANY NAME	
REGISTRATION CLASS	
DATE OF CONTRACT COMMENCEMENT WITH DES/LEI	

NOTE (READ BEFORE SIGNING)

This form when completed, signed and endorsed indicates that;

1. Registered Electrical Contractor has met all requirements and obligation as stated in the Registered Electrical Contractors Framework.
2. The CEWP/CEWI whose name and signature appears on this form has read the Registered Electrical Contractors Framework and agree to all conditions stated.
3. The CEWP/CEWI whose name/stamp and signature appears on this form has agreed to assume the responsibilities of a DES/LEI on behalf of the prospective REC whose name is stated below.

1. SIGNATURE OF CEWP/ DES/ LEI

.....

2. SIGNATURE OF REGISTERED CONTRACTING COMPANY REPRESENTATIVE

.....



HAVELLS



SML SERVICES MERCHANDIZE LIMITED



HAVELLS

Switchgear & Lighting

Crompton

Fans and Appliances



Airconditioners and Fridges



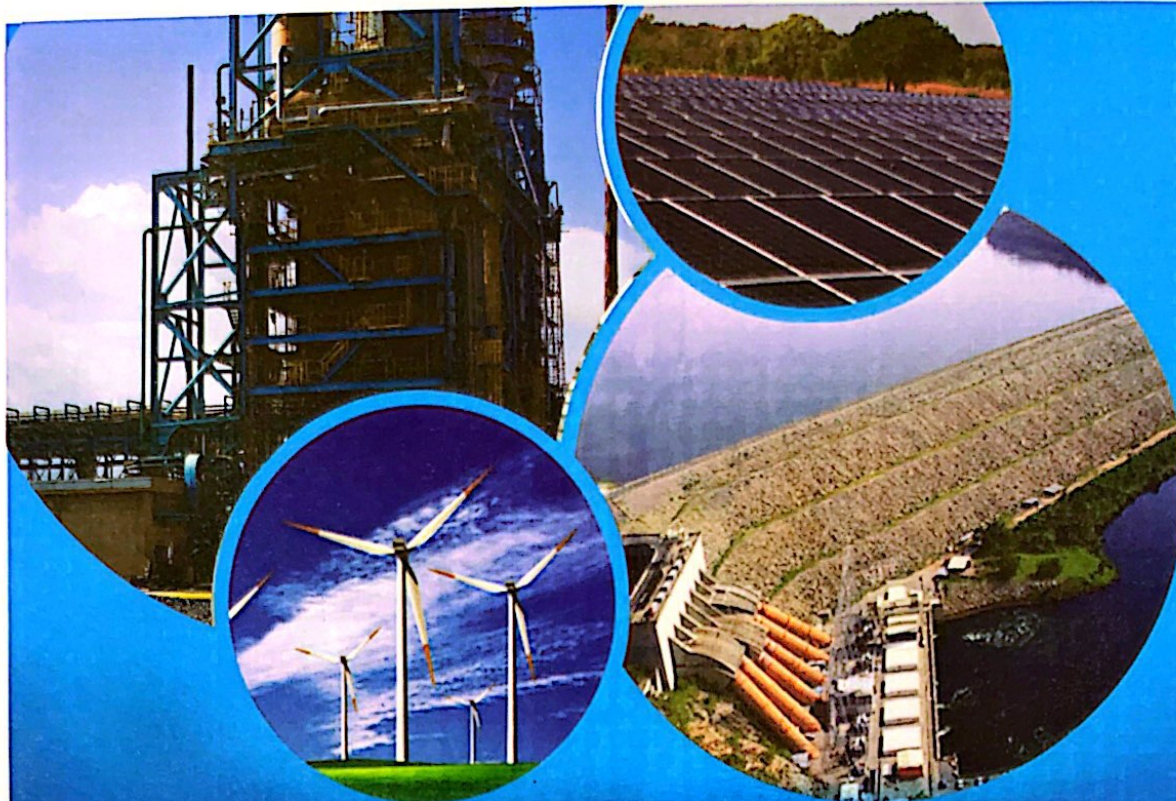
LERONE

esaachi
Electric

Wiring accessories



Contact - 055 659 0738



DIVERSIFYING OUR GENERATION PORTFOLIO FOR SUSTAINABLE POWER SUPPLY

The Volta River Authority (VRA) has since 1961, harnessed the resources of the Volta River to provide electrical energy for industrial, commercial and domestic use in Ghana as well as transportation, fishery and recreation.

Starting with a generation capacity of 588MW, the VRA now operates 2512.5MW from its hydro, thermal and solar plants.

VRA continues to diversify its generation portfolio by exploring cleaner, cheaper and renewable sources of power generation such as wind and solar energy to sustain power supply.



**VOLTA
RIVER
AUTHORITY**

For further information, please contact:
The Chief Executive

Volta River Authority
Electro Volta House
P. O. Box MB 77 Accra, Ghana
Digital Address: GA-145-7445

Tel: +233 302-664941-9
+233 302-744400 | +233-302-218540
Email: chiefx@vra.com
corpcomm@vra.com