



# **GUIDELINES FOR INSTALLATION OF ELECTRIC VEHICLE CHARGING SYSTEM IN SARAWAK**



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## 1.0 OBJECTIVE

These guidelines are developed for the following objectives:

- i. to serve as a guide for CPOs, competent persons, electrical installation contractors, and consulting engineers involved in the installation and maintenance of EVCS and their supporting infrastructure, ensuring that all systems are designed, constructed, and operated in compliance with electrical safety standards and regulatory requirements.
- ii. to ensure that the installation of EVCS complies with the Electricity Ordinance, Electricity Rules, and all relevant standards and regulations.
- iii. to outline the minimum standards and specifications for the design, installation, inspection, testing, supervision, operation, and maintenance of EVCS, promoting safe and efficient performance throughout their lifecycle.

## 2.0 SCOPE

These guidelines shall apply to any individual or entity that provides or operates an EVCS within Sarawak.

- i. The guidance encompasses all aspects of EVCS, including design, installation, operation, maintenance, safety, power quality, and licensing requirements.
- ii. This guide is not intended to override or replace any obligations or requirements stipulated under other relevant laws, ordinances, regulations, or standards. It is advisable for parties using this guide to consult the Electrical Inspectorate Unit (EIU), Electricity Supply Division for clarification on its applicability to their equipment or installations.

## 3.0 INTERPRETATION

3.1 In these guidelines, the following terms shall bear the following meanings:

|                               |                                                                                                                                                                                                                                         |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Charging Point Operator (CPO) | mean any person who provides, operates, or utilizes EVCS for the main purposes of business and commercial activities.                                                                                                                   |
| Competent Person              | means a person who holds a certificate of competency issued by the Director pursuant to rules made under section 36(1) to perform or execute work in accordance with terms, conditions, and restrictions stipulated in the certificate. |
| Director                      | mean the Director of Electricity Supply and includes any person who is acting or temporarily discharging the duties of that office.                                                                                                     |

|                                          |                                                                                                                                                                                                                                                               |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Distribution Licensee                    | means Syarikat SESCO Berhad (SESCO), who is the holder of a license to generate, transmit, distribute and supply electricity in Sarawak issued under the Electricity Ordinance (Chap. 50) and any subsequent amendments thereof.                              |
| EIU                                      | means Electrical Inspectorate Unit, Electricity Supply Division, Ministry of Utility and Telecommunication Sarawak                                                                                                                                            |
| Electric Vehicle (EV)                    | means any vehicle propelled by an electric motor drawing current from a rechargeable energy storage system, registered with Jabatan Pengangkutan Jalan (JPJ), intended primarily for use on public streets, roads or highways;                                |
| Electric Vehicle Charging Bay (EVCB)     | refers to a designated parking space equipped with a complete charging system using a functional charging device to supply electrical energy to an electric vehicle                                                                                           |
| Electric Vehicle Charging Point (EVCP)   | refers to the device used to charge the battery of an electric vehicle.                                                                                                                                                                                       |
| Electric Vehicle Charging System (EVCS)  | means complete system including the EV supply equipment and the EV functions that are required to supply electric energy to an EV for the purpose of charging;                                                                                                |
| Electric Vehicle Supply Equipment (EVSE) | means equipment or a combination of equipment, providing dedicated functions to supply electric energy from a fixed electrical installation or supply network to an EV for the purpose of charging;                                                           |
| Electricity Ordinance,                   | means the Electricity Ordinance (Cap 50) 2024 and any subsequent amendments thereof                                                                                                                                                                           |
| Electricity Rules                        | means the Electricity Rules, 1999 and any subsequent amendments thereof.                                                                                                                                                                                      |
| Energy Fee sen per duration base         | means electrical energy consumed per time or duration base, un-regulated by the Director                                                                                                                                                                      |
| Energy Tariff sen per kWh                | means electrical energy or electricity measured in kWh, regulated by the Director                                                                                                                                                                             |
| Facilities                               | any and all real property (including all buildings, fixtures or other improvements located thereon) now, hereafter or heretofore owned, leased, operated or used by Company or any of its Subsidiaries or any of their respective predecessors or Affiliates; |
| Multi-Family Dwelling                    | any residential property that contains more than one housing unit, such as a duplex, a townhome, apartment, condominium, or others that is equivalent;                                                                                                        |
| Off-Board Charger                        | charging equipment <b>outside the vehicle</b> , usually providing DC power directly to the battery;                                                                                                                                                           |
| On-Board Charger                         | Charging equipment <b>inside the vehicle</b> that converts AC input to DC to charge the battery;                                                                                                                                                              |
| Single Detached Dwelling                 | any detached building consisting of one dwelling unit that is occupied or intended to be occupied as the home or residence such as bungalows, or others that is equivalent:                                                                                   |
| State Grid Code                          | means The Electricity (State Grid Code) Rules, 2003 made under Section 36(1) of the Electricity Ordinance (Cap 50), 2024.                                                                                                                                     |

|                  |                             |
|------------------|-----------------------------|
| Utility provider | means distribution licensee |
|------------------|-----------------------------|

- 3.2 Subject to paragraph 3.1, unless explicitly stated otherwise or required by the context, all terms used in this Guide shall carry the same meaning as defined in the Electricity Ordinance and the Electricity Rules, 1999.
- 3.3 In the event of any inconsistency between the provisions of this Guide and those in other related documents, the provisions outlined in the Electricity Ordinance and the Electricity Rules, 1999 shall take precedence.

#### **4.0 EXEMPTIONS**

- 4.1 This Guide does not cover new and emerging EVCS technologies, such as Wireless Charging, Battery Swapping Stations for electric vehicles, Battery Docking Charging Stations, Swappable Battery Cabinets for electric two-wheelers, and any type of moveable charging station.
- 4.2 This Guide also excludes EVCS installations for private dwellings or residential use, as well as any existing electrical systems that do not involve the application of new or upgraded electrical supply from the utility provider.

#### **5.0 STATUTORY REQUIREMENTS**

- 5.1 All electrical wiring plans, drawings, and specifications for EVCS installations must be prepared and submitted by a professional electrical engineer holding a valid practicing certificate registered with the Board of Engineers Malaysia, or by a competent person in accordance with Rule 64 of the Electricity Rules, 1999 as follows:
  - a) Rated switchgear 60A and less: Electrical Installation Contractor (EIC), or Electrical Supervisor, or Competent Electrical Engineer.
  - b) Rated switchgear 100A and less: Electrical Supervisor, or Competent Electrical Engineer.
  - c) Rated switchgear above 100A: Competent Electrical Engineer.
- 5.2 EVCS installation and maintenance shall be carried out by a competent person who has relevant competencies as stipulated by the Electricity Ordinance and Electricity Rules, 1999
- 5.3 To ensure public safety and to protect the consumer's interests, EVCS and CPO shall comply with the requirements for Certificate of Approval for equipment.

- 5.4 Any apparatus, conductors, accessories, or equipment intended for the installation of an EVCS must comply with the requirements outlined in the Electricity Rules, 1999, and adhere to the relevant standards specified in **Appendix 1**.

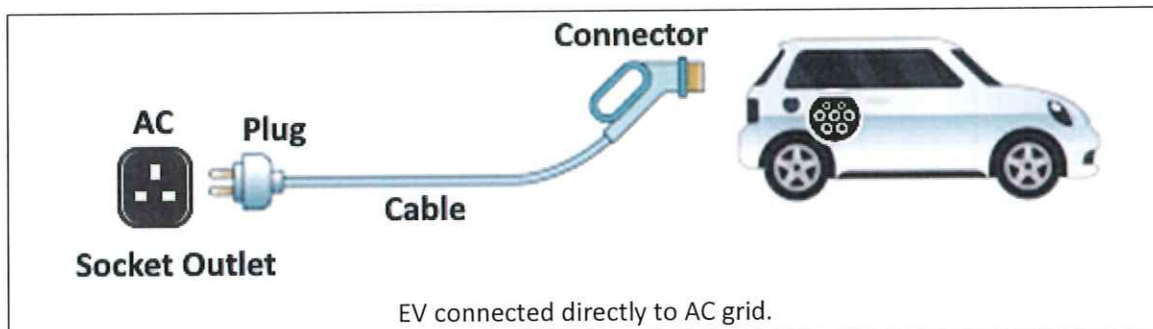
## 6.0 INSTALLATION

### 6.1 Modes of Charging

There are four modes of conductive charging of electric vehicles specified in IEC 61851 explained and illustrated as follows:

#### a) Mode 1

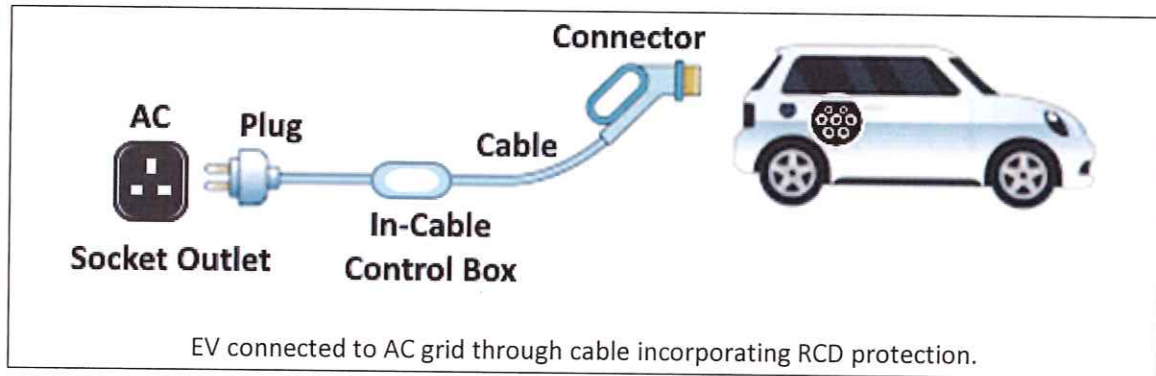
The EV is directly connected to the AC mains supply, using 240V for single-phase or 415V for three-phase systems, through a standard socket outlet not exceeding 16A and a protective earth conductor, without the inclusion of a Residual Current Device (RCD). This type of charging, known as Mode 1, lacks protection measures that enable control and communication with the electric vehicle, making it less safe compared to other charging modes. Figure 1 illustrates the Mode 1 Charging System.



**FIGURE 1:** Mode 1 Charging System

#### b) Mode 2

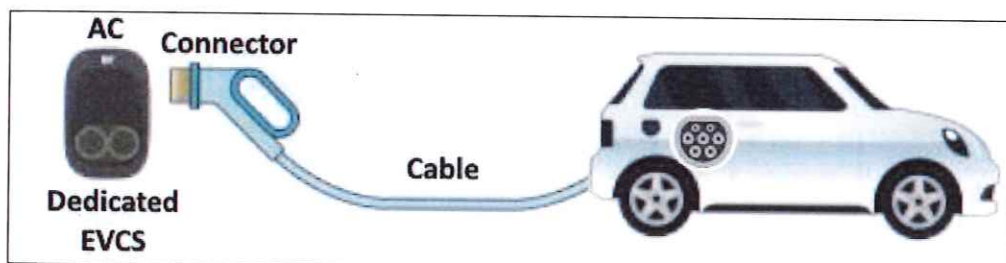
An in-cable control box is incorporated into the charging cable. The fixed electrical installations for the charging facility are similar to those of Mode 1, with the primary difference being that the final circuit, protective devices, and socket outlet must be rated appropriately to support the higher charging current, which can reach up to 32A. This type of charging is known as Mode 2. Figure 2 illustrates the Mode 2 Charging System.



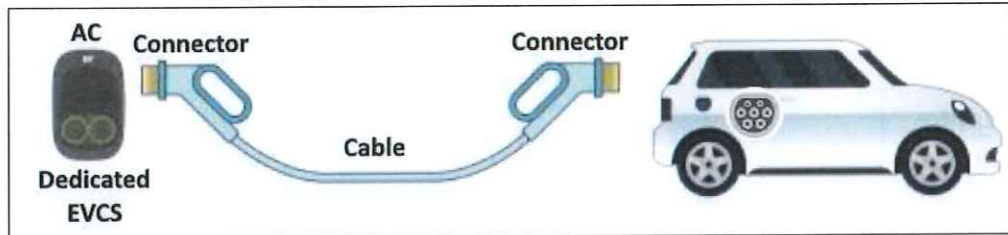
**FIGURE 2:** Mode 2 Charging System

**c) Mode 3**

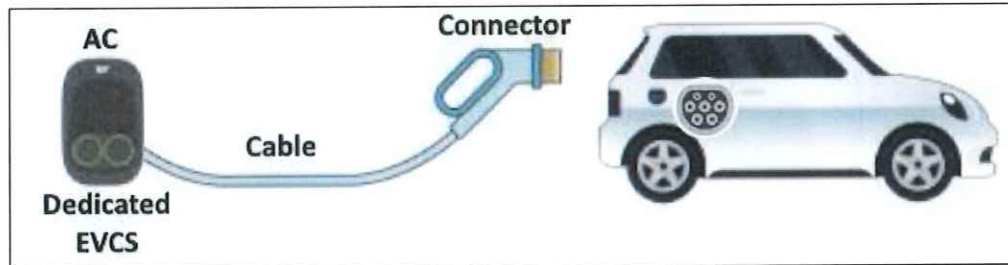
- i. For Mode 3 charging, a dedicated EVCS and charging cable assembly must be used. Mode 3 EVCS enables communication between the charging station and the electric vehicle's on-board charger, offering features such as connection verification with the EV, continuous monitoring of the protective earth conductor's integrity, control over the energization and de-energization of the supply, and the ability to select the appropriate charging rate.
- ii. A dedicated charging plug, socket, and coupler are required for Mode 3 charging system which is specifically designed for EV charging, ensuring compatibility and safety.
- iii. Depending on the power rating of the on-board charger in the EV, Mode 3 charging can deliver higher charging currents (e.g., 240V/32A, 415V/32A, 415V/63A), resulting in faster charging times.
- iv. The selection of an EVCS should be based on the charging protocol of the EV and follow the recommendations provided by the EV manufacturer.
- v. Selection of EVCS shall depend on the charging protocol of the EV and the recommendation of the EV manufacturer.



**FIGURE 3:** Mode 3a - Connection of an EV to the supply network with a plug and cable permanently attached to the EV.



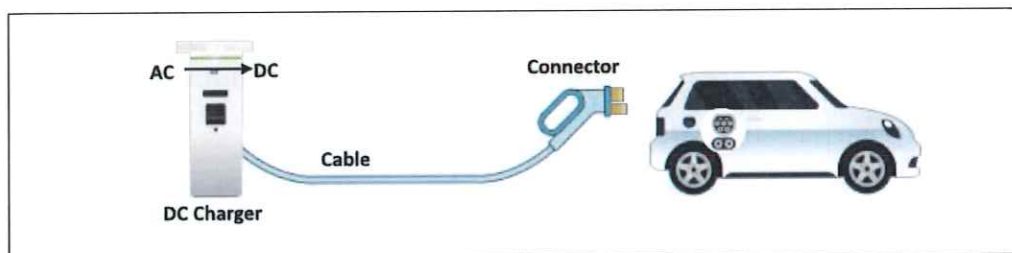
**FIGURE 4:** Mode 3b - Connection of an EV to a supply network with a cable assembly detached at both ends.



**FIGURE 5:** Model 3c - Connection of an EV to a supply utilizing a cable and vehicle connector permanently attached to the EV charging station.

#### d) Mode 4

Mode 4 charging operates by using an off-board charger to deliver DC directly to the electric vehicle's battery, bypassing the on-board charger. This method allows for DC fast charging, enabling the EV to be charged in a relatively short amount of time due to the higher electrical power involved, typically ranging from 20 kW and above.



**FIGURE 6:** Mode 4 Charging System uses an off-board charger i.e. DC Charger.

### 6.2 Compliance to the National Standard

- a) **Mode 1 charging is not permitted** due to its inability to automatically stop charging once the vehicle is fully charged.
- b) For Modes 2 and 3, only the Type 2 connector as in **Table 1** is permitted for use in EVCS. This connector features an inbuilt locking mechanism for enhanced safety and can accommodate both single-phase and three-phase charging. In contrast, the Type 1 connector is not allowed as it lacks a locking mechanism and is limited to single-phase operation.

- c) For Mode 4 charging, both the CCS Type 2 and CHAdeMO connectors are permitted for use in EVCS.

**TABLE 1:** Table EV Charger Connector and Charging Port.

| Connector Type   | Connector                                                                         | Charging Mode                          | Charging Characteristics |                   |                | Charging Port                                                                       |
|------------------|-----------------------------------------------------------------------------------|----------------------------------------|--------------------------|-------------------|----------------|-------------------------------------------------------------------------------------|
|                  |                                                                                   |                                        | Voltage                  | Current           | Power          |                                                                                     |
| IEC Type 2       |  | AC Charging<br>1-Phase<br>/<br>3-Phase | 220 V<br>/<br>415 V      | Up to<br>32 A ac  | Up to 22<br>kW |  |
| Combo CCS Type 2 |  | DC Charging                            | Up to<br>415 V           | Up to<br>400 A dc | Up to<br>240kW |  |
| CHAdeMO          |  | DC Charging                            | Up to<br>1000 V          | Up to<br>400 A dc | Up to<br>400kW |  |

### 6.3 Competent Person

- a) All electrical works such as electrical installation, maintenance and inspection shall be carried out by a competent person possessing such qualification and holding valid Certificate of Competency issued by the Electrical Inspectorate Unit (EIU).
- b) Upon completion, the Inspection Certificate (Form G) shall be duly filled out by a competent person and submitted to the EIU for review.

### 6.4 General Guides on EV Charging Facilities

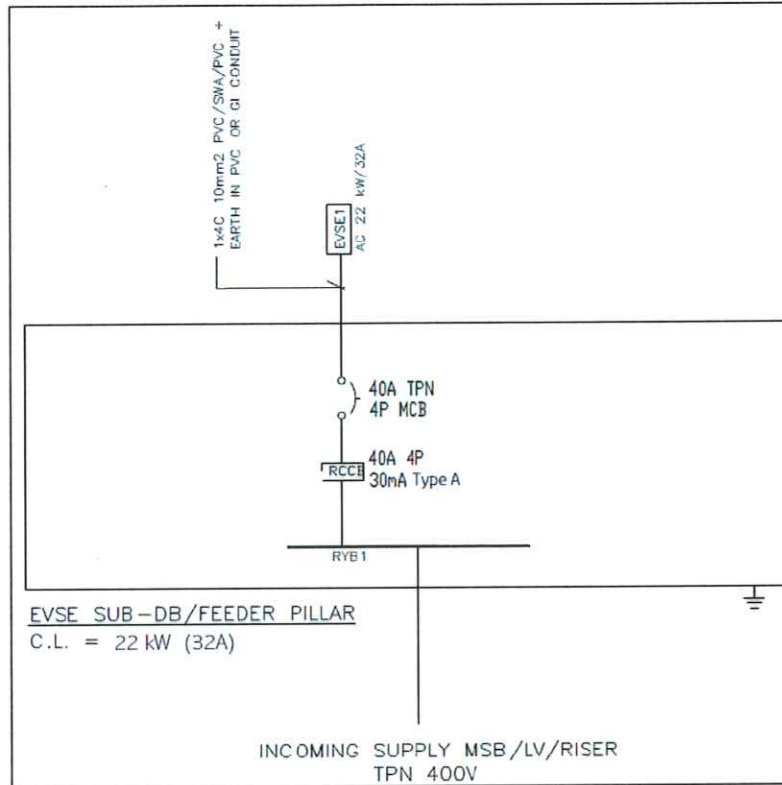
The requirements of the major components of EV charging facility are described below:

#### 6.4.1 Final Circuit

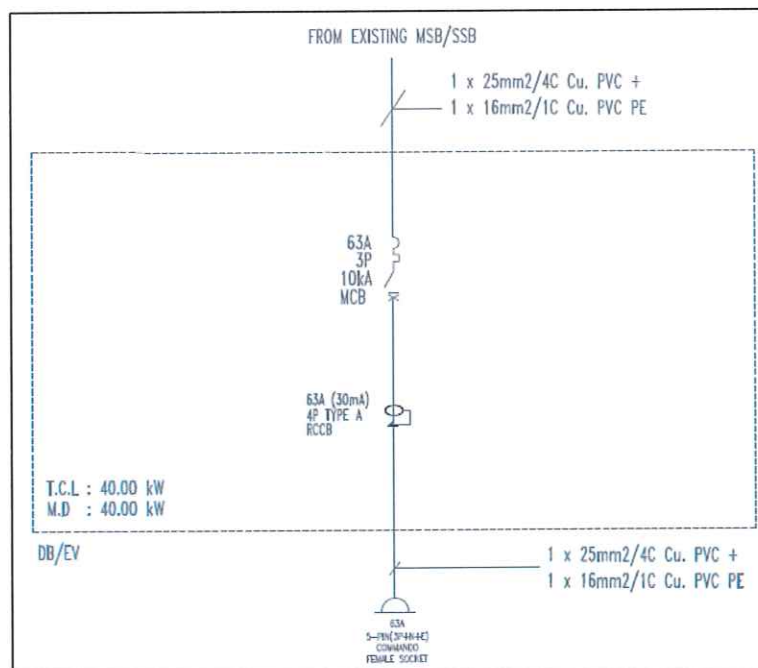
- a) Any apparatus, conductor, or accessory for the purpose of connection to an EVCS shall comply with Rules 15 of the Electricity Rules, 1999.
- b) The electrical cable used for the final circuit shall be insulated and effectively protected or safeguarded by means of metal sheath or armor or installation in steel/plastic/PVC conduits and to be placed in such a manner to prevent danger.
- c) The size of copper conductor for the electric cable in each final circuit shall be determined based on the design current of the EVCS and taking into account voltage drop constraints in the circuit. It is advisable to select a

larger conductor size to accommodate potential future upgrades of the EVCS.

- d) Cables used in final circuits shall be of continuous length and shall contain no joints.



**FIGURE 7:** Example of Single Line Diagram for AC Charging



**FIGURE 8:** Example Single-Line Diagram for Socket Outlet Supplying a Portable DC Charger



- d) The Surge Protection Device is recommended to be installed to protect the equipment from surges.
- e) The circuit must be protected from reverse power flow from EV Batteries in the event of power outage to the installation. Hence, the EVCS systems must be equipped with reverse power flow protection and anti-islanding feature in the charger system unless the EV charger is designed to only allow unidirectional power flow to charge the battery.

#### **6.4.3 Earthing**

All exposed conductive parts of the electrical installation shall be earthed in compliance with Electricity Rules, 1999 and relevant parts of MS IEC 364.

#### **6.4.4 Protection against earth leakage current**

The EVCE installation at location where the floor is likely to be wet or where the wall or enclosure is of low electrical resistance, protection against earth leakage current shall be installed for any final circuit supplying energy to the equipment as prescribed in Rules 36 of the Electricity Rules, 1999.

#### **6.4.5 Connector and Adaptor**

- a) For the Mode 2 charging, socket outlet and the associated plug used shall comply with IEC 60309.
- b) For Mode 3 charging, the type of socket outlet or vehicle connector shall comply to IEC 62196.
- c) The socket outlet shall, in general, be installed at a height of about 1.0m – 1.2m above finished floor level for easy access but the actual level may vary to suit EV user's need and site condition.
- d) EVCS and socket outlet and associated electrical equipment shall be suitable protected from ingress of dust and water to an index of protection of IPX4 for use at indoor car park. An index protection of IPX4 or higher is required for both plugged and no-plug conditions if the EV charging facility is installed and used in an outdoor environment. The use of a weatherproof enclosure to house both socket outlet and associated electrical equipment is acceptable.

#### **6.4.6 Extension Unit**

Extension and/or multi adaptor unit other than charging cable assembly designed for EV charging shall NOT be used.

#### **6.4.7 Type Test Certificate**

EVCS shall undergo type testing to ensure compliance with relevant IEC standards. Additionally, if the EVCS is intended for outdoor use, a test certificate for its ingress protection (IP) rating, in accordance with IEC 60529, must be provided. The minimum required IP rating is IP54 (suitable for indoor/outdoor use); higher IP ratings may be required based on specific installation environments. EVCS suppliers are obligated to supply all necessary test certificates to verify these standards.

### **6.5 EVCS Installation Location Requirement**

#### **6.5.1 Single Detached Dwellings**

- a) Indoor-rated EVCS may be installed in enclosed garage areas, provided they are appropriately sheltered and meet indoor installation standards.
- b) Outdoor installations of EVSE must be designed to withstand external environmental conditions and comply with outdoor standards.
- c) The EVSE should be mounted on a suitable wall at an appropriate height, considering the distance between the EV and the EVSE, as well as ease of use.
- d) Installation of EVSE in walking pedestrian walkways should be avoided to prevent accidents.
- e) Appropriate lighting and CCTV installation should be considered to enhance safety and deter vandalism.

#### **6.5.2 Multi-Family Dwelling (Apartment or Condominium)**

- a) The EVSE shall be suitably designed to operate in outdoor areas unless the location is safe from the external environment.
- b) In the case where a vehicle is parked outside the designated parking stall, the EVSE should be positioned on the vehicle's side away from any walkways to minimize tripping hazards. Pedestrian pathways should be routed behind the EVSE to ensure safety.
- c) Wheel stops should be installed with careful consideration of pedestrian traffic, particularly in areas where EV parking is not planned in public spaces. This helps prevent pedestrians from tripping over wheel stops when no vehicles are present.

- d) Building management is advised to estimate demand from existing occupants for EVSE. Additional parking lots for EVSE should be considered for future expansion.

### **6.5.3 Commercial and Public Access**

- a) The CPO and location owner are responsible for determining the position of the EVSE considering current and future demands. The location of EVSE shall always comply with other requirements set by other relevant authorities in Sarawak.
- b) The location of EVCS should be concentrated to the areas where the owners of EV or PHEV can conveniently park their vehicles for a significant amount of time. Among the suggested areas are near to the public facilities, business areas, F&B shops, entertainment outlets, shop lots, shopping mall, restaurants, public parks, sports arena, and others.

### **6.6 Other Requirements**

- a) EVCE operating instructions must be displayed in a prominent location in every parking space with EV charging facilities. Other information such as rated voltage (V), frequency (Hz), current (A), number of phases, charging rates and selections must also be displayed.
- b) Other information such as system energization, vehicle connection verification, and circuit protective conductor integrity detection may be considered.
- c) For Mode 2 charging, a bracket or hanging device for supporting the weight of in-cable control box of the EV charging cable shall be provided as far as practicable to avoid excessive loading on the EV charging cable and plug.
- d) Directional signages at various locations are recommended to direct EV drivers to designated parking spaces with EV charging facilities.
- e) Occupancy sensors to indicate the availability of EV charging facilities may be considered to facilitate EV owners before considering charging their vehicles at EV. This includes providing indicator lights at charging facilities to indicate charging is in use or otherwise.
- f) EVCS owners are also advised to take certain practical steps to avoid the use of lots reserved for EV charging by irresponsible people. CCTV surveillance may be considered to improve security and safety.
- g) CPOs are advised to refer to the latest Garispanduan Perancangan Petak Pengecasan Kenderaan Elektrik (EVCEB) issued by PLAN Malaysia and the Garispanduan Keselamatan Kebakaran bagi Electric Vehicle Charging Bay di Premis

provided by Jabatan Bomba dan Penyelamat Malaysia (JBPM). CPOs should also comply with any additional guidelines issued periodically by other relevant authorities to ensure safe, efficient, and compliant operation of EV charging bays.

## **7.0 OPERATION**

### **7.1 General Operation**

#### **7.1.1 Protection against Vehicle Impact**

The EVCS should be installed in a place or position which lowers the risk of vehicle impact. Necessary protection barriers such as wheel stops should be available.

#### **7.1.2 Main Isolation Switch**

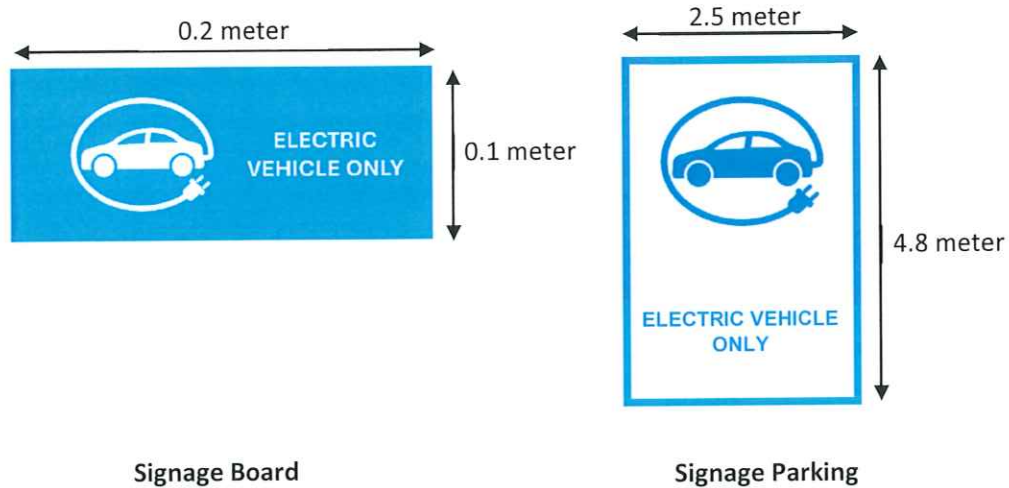
Each EVCB shall have an automatic and manual main electrical isolation switch. The position of the main electrical isolation switch should be at least 3 meters from the EVCB and EVCP but not more than 15 meters.

#### **7.1.3 Flood Damage**

The EVSE must be positioned in a location that is safe from flooding.

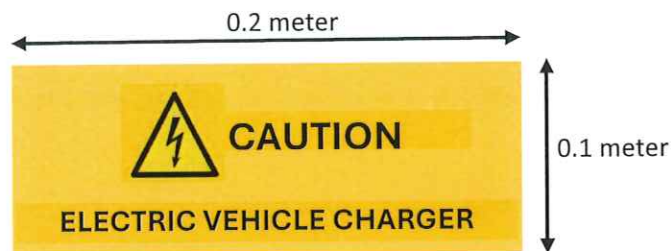
#### **7.1.4 Signage Requirements**

- a) Simple and understandable signages for the indications of the charging stations/facilities should be placed in the easily spotted areas, such as around the public charging stations, workplace areas, parking garages and multi-unit residential complexes, which have access to the EVCS.
- b) The standard signage on public highways, streets, petrol stations, shopping centers and airport, must come with signage "**KENDERAAN ELEKTRIK SAHAJA**" or "**ELECTRIC VEHICLES ONLY**" with pavement markings, painted on the surface of a parking space to indicate the place for charging stations as in Figure 10.



**FIGURE 10:** Standard Signage

- c) Signage and electric vehicle lot for disable or "OKU" is recommended.
- d) Caution signage shall be provided to indicate the hazard at the charging station as in Figure 11.



**FIGURE 11:** Caution Signage

#### **7.1.5 Lighting Requirements**

- a) The area of the EVCS should be adequately lighted, ventilated, and free from obstruction so that users and operators can clearly see the signages and operate the charger safely.
- b) Measurement using a lux meter should be performed to ensure that a minimum of 300 lux of lighting is available unless otherwise specified.

#### **7.1.6 The capability of networking monitoring for status and fault reports**

- a) CPO or owner of EV charger is encouraged to equip EVCS with a system that can be used to monitor the operation and real time status of the charging system to assist them to manage the EVCS more effectively.

- b) The usage patterns and power consumption may also be monitored on a regular basis.

#### **7.1.7 Instructions to use the charging system.**

EV charger user manuals including indicator information and meaning should be placed in the easily spotted area.

#### **7.1.8 Canopy Roofing Requirement**

- a) CPO and EV charger owners are encouraged to install a reasonable size permanent roof and structure for EVCS that is located outside the covered area. This is to ensure that charging facility is safe and usable during raining time, ensuring the safety and comfort of users, and protecting the charging device from extreme weather conditions.
- b) CPO and EV charger owners may place their corporate identity and branding on any part of the structure.

#### **7.1 Safety Audit Requirement**

All operators, owners, and CPOs shall comply with the following safety requirements.

##### **7.2.1 Safety Management Programme**

- a) Owners and Operators of non-domestic EVCS, licensed EVSE installations for retail, and licensed EVCS installations for private use shall establish their comprehensive Safety Management Programs for each of EVCS.
- b) All operational works and procedures of the EVCS shall be clearly written and in accordance with the requirements of these Guidelines, and the owner's and/or operator's Safety Management Programme. The Safety Management Programme shall include but not limited to the following requirements:
  - Comply with safety requirements, and standard practices.
  - Prioritizing the safety of building occupants, public, operators and workers.
  - The right way of operation and testing, monitoring, and maintenance of the EVCS.
  - A risk assessment program should be assessed from time to time to ensure EVCS is operating at an optimal and safe level.

- An emergency plan (e.g. fire, explosion electric shock); and
- Special precautions to be undertaken when working in confined spaces.

### **7.2.2 Reporting of Accidents and Fires**

- a) As required by Section 14 of the Electricity Ordinance, whenever an accident or fire causing or resulting in loss of life or personal injury, or of such a kind as to affect public safety, or serious damage to property has occurred in connection with any electrical installation, the owner or the management shall report the accident or fire to the Director by the quickest mean available, and subsequent with the least possible delay shall report in writing to the Director the facts of the accident or fire so far as they are known to the owner or management respectively.
- b) Accidents or fire incidents that shall be notified include but are not limited to the following:
  - A fatality due to electrocution.
  - An accident where there has been a serious injury such as electric shock, fractured, burns, etc; or
  - Serious damage to property due to a fire incident.

## **8.0 MAINTENANCE**

### **8.1 General Inspection and Maintenance**

- a) The EVCS shall be properly maintained in good and safe working condition at all times, and all necessary safety precautions shall be observed to prevent any danger.
- b) The responsibility to maintain the EVSE shall be with the CPO.
- c) The EVSE shall be inspected, checked, and tested by a competent person at least once every twelve (12) months, or at such intervals as may be determined necessary by the Director.
- d) The Electrical Inspectorate Unit (EIU) may inspect the EVCS if deemed necessary for public interest or safety. Written notice will be provided to the CPO, requiring their attendance and assistance as specified in the notice issued by the EIU.

- e) Repair or maintenance of the equipment shall be carried out by a competent person holding such qualifications and holding a valid certificate of competency.
- f) The management of EVCS may issue a permit to work (PTW) to their contractors, workers, operators, agents, or any person that is directly engaged with the EVCS installation for maintenance, testing or inspection.

## **8.2 Maintenance Schedule**

- a) All components of the electrical installation and equipment associated with the EVCS shall be properly maintained, tested, and inspected regularly to ensure safe operation. The maintenance schedule should be included in the Safe Working Programme and must encompass the followings:
  - i. Periodic inspection and/or testing schedule by competent person.
  - ii. Maintenance schedules; and
  - iii. A schedule for replacing components that are nearing the end of their operational lifespan.

## **8.3 Maintenance Record**

- a) All records pertaining to the design, construction, operation, inspection, testing, and maintenance of the electrical installation associated with the EVCS shall be maintained, periodically updated, and made accessible to relevant and authorized personnel.
- b) The Inspection Certificate (Form G) must be signed by a competent person upon the completion of inspection and/or testing activities.

## **8.4 Electrical Safety Sticker**

- a) An electrical safety sticker shall be affixed to each EVSE to provide users with clear electrical safety assurance. This sticker acts as official proof that the EVCS has undergone regular safety inspections and maintenance, confirming compliance with the regulatory requirements.
- b) The sticker shall be affixed in a location that is easily accessible and visible to users for quick reference.
- c) The dimensions and detailed specifications of the electrical safety sticker are provided in **Figure 12**.



**Figure 12:** Electrical Safety Sticker

### **8.5 Use of Personal Protective Equipment**

Persons undertaking maintenance work must be trained and deemed competent in the use of Personal Protective Equipment (PPE) as required, and they should hold valid safety cards or certificates issued by the relevant authorities. The utilization of appropriate safety gear, devices, or tools during these tasks is mandatory.

## **9.0 POWER QUALITY**

- 9.1 The CPO is responsible for ensuring that the operation of EVCS does not negatively impact on the power quality of the distributor's grid system. This includes preventing issues such as harmonics, flicker, under-voltage, and other disturbances. The operation of EVCS must comply with the operational standards outlined in the State Grid Code.
- 9.2 The Director has the authority to instruct the CPO to implement necessary modifications to the EVCS installation to ensure compliance with the Electricity Ordinance, Electricity Rules, 1999, and the State Grid Code.
- 9.3 The CPO shall maintain comprehensive records of the maximum daily load and the total energy sold per month. Additionally, any other information deemed necessary by the Director must also be documented. These records shall be produced within the timeframe specified by the Director to ensure transparency and compliance.

## **10.0 LICENSING**

- 10.1 CPOs shall note and comply with licensing requirements as stipulated under Section 4(1) of the Electricity Ordinance.
- 10.2 Applications for an EVCS license shall be submitted to the Director in **Form A** as specified in the First Schedule of the Electricity Rules, 1999.
- 10.3 Documents required for application of license application are in Appendix 2.

## **11.0 REGISTRATION OF EVCS**

- 11.1 All EVCS, unless exempted under paragraph 4 of this guide, shall be registered with the Electrical Inspectorate Unit. Applications for the registration of EVCS should be submitted using Form EIU/EVCS/01, accompanied by Form B as specified in the First Schedule of the Electricity Rules, 1999.
- 11.2 Any changes in the ownership of EVCS referenced in paragraph 12.1 shall be submitted to the Director for consideration. The Director reserves the right to reject the application and provide reasons for the decision to the applicant.
- 11.3 Fees for registration of installation and renewal of the registration of EVCS is in Appendix 4.
- 11.4 Fees for inspection and test of EVCS is in Appendix 5.

## **12.0 CANCELLATION, REMOVAL AND REINSTATEMENT OF CERTIFICATE OF REGISTRATION**

- 12.1 The Director may cancel, suspend or revoke the Certificate of Registration if:
  - a) the CPO ceases to carry on the business in respect of which he is registered;
  - b) the CPO has been adjudicated a bankrupt;
  - c) the business goes into liquidation;
  - d) the CPO or his servant or agent contravenes or fails to comply with any provision of the Ordinance and Rules;
  - e) the CPO has obtained the Certificate by making or causing to be made false or fraudulent declaration, certification or representation, either in writing or otherwise.

- f) The CPO failed to renew his registration on the date of expiry thereof;
- 12.2 A CPO whose name has been removed from the Register under Para 12.1 may appeal within 30 days of the removal from the Register, for the reinstatement thereof and the Director, upon receipt of satisfactory evidence and reasons for the reinstatement, may register him again.
- 12.3 The CPO who feels aggrieved by the decision of the Director not to reinstate him may apply to the Minister in writing for reconsideration of the matter within 21 days from the date of the decision of the Director not to reinstate him.
- 12.4 The decision of the Minister on the matter referred to him under subrule 12.3 shall be final.

### **13.0 ARBITRATION ON TECHNICAL MATTERS**

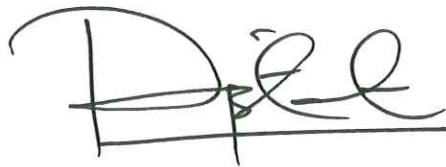
- 13.1 All technical matters, differences, or disagreements whatsoever which may at any time hereinafter arise shall be referred to the Director.

### **14.0 AMENDMENT AND VARIATION**

- 14.1 The Director may, at any time amend, modify, vary or revoke these guidelines.

### **15.0 EFFECTIVE DATE**

- 15.1 This Guideline will take effect on the date it is signed by the Director of Electricity Supply.



-----  
**Director of Electricity Supply**  
**Ministry of Utility and Telecommunication**  
**Sarawak**

Date:

Ref. No.:

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## Appendix 1: EVCS Standards Requirements

| NO | INTERNATIONAL STANDARDS | NATIONAL STANDARDS     | DETAIL DESCRIPTION                                                                                                                                                                                       |
|----|-------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | IEC 61851-1:2017        | MS IEC 61851-1:2021    | Electrical vehicle conductive charging system – Part 1: General Requirement                                                                                                                              |
| 2  | IEC 61851-21-1:2017     | MS IEC 61851-21-1:2021 | Electrical vehicle conductive charging system – Part 21-1 Electrical vehicle on-board charger EMC requirements for conductive connection to AC/DC supply                                                 |
| 3  | IEC 61851-21-2:2018     | MS IEC 61851-21-2:2021 | Electric vehicle conductive charging system – Part 21-2: Electrical vehicle requirements for conductive connection to an AC/DC supply – EMC requirements for off board electric vehicle charging systems |
| 4  | IEC 61851-23:2014       | MS IEC 61851-23:2021   | Electric vehicle conductive charging system – Part 23: DC electric vehicle charging station                                                                                                              |
| 5  | IEC 61851-24:2014       | MS IEC 61851-24:2021   | Electric vehicle conductive charging system – Part 24: Digital EV charging station and an electric vehicle for control of d.c. charging                                                                  |
| 6  | IEC 61851-25:2020       | N/A                    | Electric vehicle conductive charging system – Part 25: DC EV supply equipment where protection relies on electrical separation                                                                           |
| 7  | IEC 60364-7-722:2018    | N/A                    | Low-voltage electrical installations – Part 7-722: Requirements for special installations or locations – Supplies for electric vehicles                                                                  |
| 8  | IEC 61439-7:2018        | N/A                    | Low-voltage switchgear and control gear assemblies – Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electrical vehicle charging stations                   |
| 9  | IEC TR 61850-90-8:2016  | N/A                    | Communication networks and systems for power utility automation – Part 90-8: Object model for E-mobility                                                                                                 |
| 10 | IEC 61980-1:2020        | N/A                    | Electric vehicle wireless power transfer (WPT) systems – Part 1: General requirements.                                                                                                                   |

|    |                            |                     |                                                                                                                                                                                                                                              |
|----|----------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11 | IEC 62196-1:2014           | MS IEC 62196-1:2021 | Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 1: General Requirement                                                                                                        |
| 12 | IEC 62196-2:2016           | MS IEC 62196-2:2021 | Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 2: Dimensional compatibility and interchangeability requirements for a.c. pin and contact-tube accessories                    |
| 13 | IEC 62196-3:2014           | MS IEC 62196-3:2021 | Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 3: Dimensional compatibility and interchangeability requirements for a.c. and a.c./d.c. pin and contact-tube vehicle couplers |
| 14 | IEC TS 62196-3-1:2020      | N/A                 | Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 3-1: Vehicle connector, vehicle inlet and cable assembly for DC charging intended to be used with a thermal management system |
| 15 | IEC 62752:2016+AMD1:2018   | N/A                 | In-cable control and protection device for mode 2 charging of electric road vehicles (IC-CPD)                                                                                                                                                |
| 16 | IEC PAS 62840-3:2021       | N/A                 | Electric vehicle battery swap system – Part 3: Particular safety and interoperability requirements for battery swap systems operating with removable RESS/Battery Systems                                                                    |
| 17 | IEC 62893-1:2017+AMD1:2020 | N/A                 | Charging cables for electric vehicles for rated voltages up to and including 0,6/1 kV – Part 1: General Requirements                                                                                                                         |
| 18 | IEC 62893-2:2017           | N/A                 | Charging cables for electric vehicles for rated voltages up to and including 0,6/1 kV – Part 2: Test Methods                                                                                                                                 |
| 19 | IEC 62893-3:2017           | N/A                 | Charging cables for electric vehicles for rated voltages up to and including 0,6/1 kV – Part 3: Cables for AC charging according to modes 1,2 and                                                                                            |

|    |                          |                    |                                                                                                                                                                                                                          |
|----|--------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                          |                    | 3 of IEC 61851-1 of rated voltages up to and including 450/750 V                                                                                                                                                         |
| 20 | IEC 62893-4-1:2020       | N/A                | Charging cables for electric vehicles for rated voltages up to and including 0,6/1 kV – Part 4-1: Cables for DC charging according to modes 4 of IEC 61851-1-DC charging without use of a thermal management system      |
| 21 | IEC 62893-4-2:2021       | N/A                | Charging cables for electric vehicles for rated voltages up to and including 0,6/1 kV – Part 4-2: Cables for DC charging according to modes 4 of IEC 61851-1- Cable intended to be used with a thermal management system |
| 22 | IEC 62955:2018           | N/A                | Residual direct current detecting device (RDC-DD) to be used for mode 3 charging of electric vehicles                                                                                                                    |
| 23 | IEC TS 62840-1:2016      | N/A                | Electric vehicle battery swap system – Part 1: General and guidance                                                                                                                                                      |
| 24 | IEC 62840-2:2016         | N/A                | Electric vehicle battery swap system – Part 2: Safety Requirements                                                                                                                                                       |
| 25 | IEC 62305-1:2006         | MS IEC 62305:2007  | Protection Against Lightning – Part 1: General Principles (First Revision)                                                                                                                                               |
| 26 | IEC 61000-4-11:2004, MOD | MS 61000-4-11:2015 | Testing and Measurement Methods- Voltage dips, short interruptions and voltage variations immunity tests (Second Revision)                                                                                               |
| 27 | IEC 61000-4-34:2009, MOD | MS 61000-4-34:2014 | Testing and Measurement Techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with mains current more than 16 A per phase (First Revision)                                  |

**NOTES**

- (a) If no MS or MS IEC standard exists, the relevant IEC or other recognized standard shall apply.

## Appendix 2: Document Required for Licence Application

| NO | MANDATORY DOCUMENTS                                                                                  | ADDITIONAL DOCUMENTS |
|----|------------------------------------------------------------------------------------------------------|----------------------|
| 1  | Endorsed Application Form (Form A and Form B as in the First Schedule of the Electricity Rules 1999) |                      |
| 2  | Statutory documents for Company Registration                                                         |                      |
| 3  | Location and Floor Plan                                                                              |                      |
| 4  | Schematic Drawings                                                                                   |                      |
| 5  | Consent Letter for Installation (Building owner or local Authority)                                  |                      |
| 6  | Rental, Collaboration or Service Agreement (if any)                                                  |                      |
| 7  | Form G with endorsed Test Result by Competent Person                                                 |                      |
| 8  | Project Summary (as per Table A below)                                                               |                      |
| 9  | Certificate of Approval/Release Letter for charger (in future)                                       |                      |

| CHARGER SPECIFICATION TABLES<br>( EXAMPLE ) |                          |                          |                          |
|---------------------------------------------|--------------------------|--------------------------|--------------------------|
| PROJECT SUMMARY:                            |                          |                          |                          |
| BRAND / MODEL                               | XXX                      | XXX                      | XXX                      |
| NO OF UNIT                                  | 1                        | 2                        | 2                        |
| RATED INPUT POWER (kW)                      | 150 kW                   | 60 kW                    | 22 kW                    |
| MAX CHARGING/OUTPUT POWER ( AC OR DC )      | 120 kW / DC              | 50 kW / DC               | 22 kW / AC               |
| MODE OF CHARGING                            | MODE 4                   | MODE 4                   | MODE 3                   |
| CONNECTOR TYPE                              | 2 x CCS TYPE 2 / CHAdeMO | 1 x CCS TYPE 2 / CHAdeMO | 1 x TYPE 2               |
| OUTPUT CABLE SIZE / TYPE (NOZZLE CABLE)     | 4 X 150 MM2 (AC PVC/AL)  | 1 X 35 MM2 ( AC PVC/AL ) | 1 X 10 MM2 ( AC PVC/AL ) |

Note: The Charger specifications table shall be included in the Project Summary as above.

### Appendix 3: List of Key Application Criteria for EVCS.

| NO | APPLICATION CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                          | COMPLY, Y/N ? |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1  | Application for licence shall be made by CPO.                                                                                                                                                                                                                                                                                                                                                                                                 |               |
| 2  | CPO shall be a registered Company under the Companies Commission of Malaysia (SSM).                                                                                                                                                                                                                                                                                                                                                           |               |
| 3  | Applicants need to comply with Sarawak Electricity Ordinance.                                                                                                                                                                                                                                                                                                                                                                                 |               |
| 4  | Applications for EVCS licenses shall obtain approval on location and source of all capacity units.                                                                                                                                                                                                                                                                                                                                            |               |
| 5  | Applicant needs to apply from the distribution licensee for dedicated electricity power supply.                                                                                                                                                                                                                                                                                                                                               |               |
| 6  | All drawings, plans and specifications shall be approved by a suitable qualified Competent Electrical Engineer or Professional Electrical Engineer who is registered with the Board of Engineers Malaysia with Practicing Certificate.                                                                                                                                                                                                        |               |
| 7  | License capacity shall be based on maximum output capacity of charging units.                                                                                                                                                                                                                                                                                                                                                                 |               |
| 8  | <p>Upon Commissioning of an installation, the applicant is required to submit the following forms to the Ministry of Utility and Telecommunication, Sarawak</p> <ul style="list-style-type: none"> <li>i. Form B of the First Schedule in the Electricity Rules, 1999</li> <li>ii. Form G of the First Schedule in the Electricity Rules, 1999</li> <li>iii. other relevant forms as may require by the Director from time to time</li> </ul> |               |

## Appendix 4: Fee for Registration of Installation and Renewal

### FEES FOR REGISTRATION OF INSTALLATION AND RENEWAL

*(Part II Second Schedule of the Electricity Rules, 1999)*

Fees according to the following fees shall be payable for the registration of installation or renewal of the registration:

| No. | <i>Capacity of Installation</i>                              | <i>Fees for 12 months</i> |
|-----|--------------------------------------------------------------|---------------------------|
| (a) | for each installation of 10 kilowatts or less                | RM20                      |
| (b) | for each installation above 10 kilowatts to 50 kilowatts     | RM50                      |
| (c) | for each installation above 50 kilowatts to 100 kilowatts    | RM500                     |
| (d) | for each installation above 100 kilowatts to 300 kilowatts   | RM1,000                   |
| (e) | for each installation above 300 kilowatts to 600 kilowatts   | RM1,500                   |
| (f) | for each installation above 600 kilowatts to 1000 kilowatts  | RM2,000                   |
| (g) | for each installation above 1000 kilowatts to 2500 kilowatts | RM3,000                   |
| (h) | for each installation above 2500 kilowatts to 5000 kilowatts | RM5,000                   |
| (i) | for each installation above 5000 kilowatts                   | RM1.00 per kilowatt       |

## Appendix 5: Fee for Inspection and Test of an EVCS

### FEES FOR INSPECTION AND TEST OF INSTALLATION

*(Part III Second Schedule of the Electricity Rules, 1999)*

The following fees shall be charged for inspection and test of the installation:

| No. | <i>Capacity of Installation</i>                             | <i>Fees for inspection and test</i> |
|-----|-------------------------------------------------------------|-------------------------------------|
| (a) | for each installation of 50 kilowatts or lower              | RM50                                |
| (b) | for each installation above 50 kilowatts to 100 kilowatts   | RM100                               |
| (c) | for each installation above 100 kilowatts to 300 kilowatts  | RM150                               |
| (d) | for each installation above 300 kilowatts to 600 kilowatts  | RM200                               |
| (e) | for each installation above 600 kilowatts to 1000 kilowatts | RM250                               |
| (f) | for each installation above 1000 kilowatts                  | RM300                               |

