Guidance Note on Fixed Electrical Installations with Modular Integrated Construction (MiC) Method / Multi-trade Integrated Mechanical, Electrical and Plumbing (MiMEP) Method

1. Introduction

1.1 The purpose of this guidance note is:

(a) to draw the attention of MiC/ MiMEP contractors, project developers, owners of MiC/ MiMEP modules, private developers, electricity/ gas supply companies, etc. to the requirements on the design, construction and installation of fixed electrical installations in buildings/ developments with MiC method/ MiMEP) method;

(b) to draw the attention of the Registered Electrical Contractor (REC) and Registered Electrical Worker (REW) to the requirements on fixed electrical installations in buildings/ developments and their obligations; and

(c) to give guidance on the requirements which must be met in the design selection and installation of wiring and fixed electrical installations.

2. Code of Practice for the Electricity (Wiring) Regulations

2.1 The Electricity (Wiring) Regulations (Cap. 406E), hereinafter referred as the "Wiring Regulations", is one of the subsidiary regulations of the Electricity Ordinance (Cap. 406), hereinafter referred as the "Ordinance". The Wiring Regulations stipulate the safety requirements for the design, installation, testing and certification of fixed electrical installation. The Code of Practice for the Electricity (Wiring) Regulations (CoP) is published to give general technical guidelines on how the statutory requirements of the Wiring Regulations can be met. Compliance with the CoP should achieve compliance with the relevant aspects of the Wiring Regulations.

2.2 In some instances, the fixed electrical installation which is designed, constructed and installed to an equivalent or higher national/ international standards may be deemed to have met the requirements of the CoP.

3. Interpretation

For the purposes of the Guidance Note, some of the definitions used in the Ordinance, the Wiring Regulations and the CoP have been extracted herein for ease of reference:

(a) "cable coupler" means a device enabling the connection or disconnection, at will, of two flexible cables. It consists of a connector and a plug.

(b) "electrical work" means work in relation to the installation, commissioning, inspection, testing, maintenance, modification or repair of a low voltage or high voltage fixed electrical installation and includes the supervision and certification of that work and the certification of design of that installation;

(c) "fixed electrical installation" means a low or high voltage electrical installation that is fixed to premises but does not include any electrical equipment that is supplied with electricity after passing through a socket of the installation at which the supply can be disconnected without the use of a tool;

(d) "registered electrical contractor"(REC) means an electrical contractor registered under Section 33 of the Ordinance;

(e) "registered electrical worker"(REW) means an electrical worker registered under Section 30 of the Ordinance; and

(f) "wiring installation" means that part of a fixed electrical installation that is used for the distribution and control of electricity, including fittings, accessories, devices and switches but excluding current-using equipment.

In addition to the above well-interpreted definitions, the following definitions shall apply:

(a) "Prefabricated wiring system" consists of wiring sections incorporating the means of inter-connection designed to allow sections to be connected together forming a wiring installation system; and

(b) "Work Completion Certificate (i.e. Form WR1)" is the certificate in a form specified by the Director of Electrical and Mechanical Services (DEMS) to be issued and certified by a REW and endorsed by REC for the purpose of Regulations 19(1) and 19(2) of the Wiring Regulations.

4. Requirements on Electrical Work

4.1 General

(a) According to Section 31 and Section 34 of the Ordinance, the electrical work shall be carried out by a REC and the REC should employ appropriate grades of REWs to do the electrical work.

4.2 Certification of Electrical Work

(a) When a REC is employed to carry out the design of fixed electrical installation including the wiring installation at an early stage of a

development with MiC/ MiMEP method, a REW employed by this REC shall certify the design of fixed electrical installation and this REC shall endorse the certificate (i.e. Part 1 of Work Completion Certificate) to confirm the fixed electrical installation has been designed in accordance with the Ordinance.

(b) When the same or another REC is employed for carrying out electrical installation work at premises, the fixed electrical installation shall, after completion (including any work completed after repair, alteration or addition) and before it is energized for use, be inspected, tested and certified by a REW of this REC and this REC shall endorse the certificate (i.e. Part 2 of Work Completion Certificate) to confirm that the fixed electrical installation complies with the requirements of the Ordinance and is in safe working order.

(c) For part of the electrical installations being constructed and installed in modules at the off-site workshops (e.g. factories outside Hong Kong), these parts of electrical installations could be regarded as a MiC/ MiMEP electrical assembly and should be inspected and tested to the satisfaction of the REC mentioned in paragraph (b) before delivery to the site for permanent module fixing. In addition, this REC shall also ensure the MiC/ MiMEP electrical assembly being constructed and installed at the off-site workshop with suitable materials and good workmanship. This REC is recommended to establish or agree with the factory to implement a quality control and supervision system including the factory test requirements (e.g. the items listed in Code 21B of the CoP) to ensure the MiC/ MiMEP electrical assembly being constructed and installed at the off-site workshop with good workmanship and quality. (Refer to the flow chart in Annex A for the establishment and implementation of a quality control and supervision system in MiC/ MiMEP)

5. Design Consideration for MiC/ MiMEP

5.1 Selection of Equipment and Materials

(a) All equipment and materials chosen and used in an electrical installation shall comply with the relevant national/ international standards and so certified by the national/ international organisations or any testing and certification authorities recognised or approved by Director in accordance with the Code 4A of the CoP.

5.2 Selection and Erection of Wiring Installation

(a) Wiring installation in buildings/ developments with MiC method/ MiMEP method is generally classified as the following types:

(i) The wiring installation and associated electrical installation such as distribution board, switches, socket outlets, fuse spurs, lighting connection units and etc. of a module are installed at a factory. There is no electrical inter-connection with other modules. After the entire module installed on-site,

the power supply will be connected to the distribution board of that module;

(ii) The wiring installation and associated electrical installation such as switches, socket outlets, fuse spurs, lighting connection units and etc. of a module are installed at a factory. After the entire modules installed on-site, the power supply will be connected to the distribution board of a module that has been already installed at the factory, whilst cable connections between the modules will be carried out on-site at the termination boxes or through "looping-in" wiring system to the equipment terminals of a module so as to complete the circuits;

(iii) The prefabricated wiring system and associated electrical installation such as switches, socket outlets, fuse spurs, lighting connection units and etc. of a module are installed at a factory. After the entire modules installed on-site, the power supply will be connected to the distribution board of a module that has been already installed at the factory, whilst cable connections between the modules will be carried out on-site via cable couplers so as to complete the circuits.

(b) The RECs should determine a suitable installation type at an early design stage of the MiC/ MiMEP system, in particular, if the termination boxes and/or cable couplers are to be used for cable connections between the modules, the provision of access points to facilitate inspection, repair or maintenance should be considered and indicated on as-fitted drawings.

6. Requirements on Wiring Installation

6.1 The general technical requirements on conductors, joints and connections are stipulated in Code 13 of the CoP.

6.2 Where a box is used to terminate the cables for completing the circuits between the modules, this box for termination of cables shall comply with BS 4662 or IEC 60670-1. The cables shall be terminated with fix-mounted terminal blocks complying with IEC 60947-7 series.

6.3 The wires at a termination box shall be distinctively labeled to facilitate wire checking. The wires shall be straight-run without any joints between terminal points/ equipment terminals.

6.4 The general workmanship on installation of cables as well as cable termination are stipulated in Code 25C and 25D of the CoP respectively.

7. Requirements on Prefabricated Wiring Systems

7.1 The prefabricated wiring system is selected and is intended for permanent connection in fixed electrical installation of the buildings/ developments shall comply with BS 8488 or equivalent.

7.2 The prefabricated wiring system shall incorporate cable couplers that conform to IEC 61535 or equivalent. The cable couplers shall be distinctively labeled to facilitate electrical circuit checking.

7.3 The prefabricated cables should be run in a vertical or horizontal direction, where practicable, and should be secured flat on the surface of walls, columns, partitions or ceilings, etc. throughout the entire route.

7.4 The prefabricated wiring system shall be installed by REWs or skilled persons under the instruction of REW, including the connection and disconnection of cable couplers.

8. Obligation of Registered Electrical Contractor (REC)

8.1 The REC should ensure that the on-site and off-site fixed electrical installation in the buildings/ developments in MiC/ MiMEP modules are properly carried out with safe and sound materials that conform to the Ordinance, the CoP and this Guidance Note. Where deem necessary, the MiC/ MiMEP contractor should liaise with the project owner and the relevant RECs at an early stage, for the establishment and implementation of a quality control and supervision system for the electrical work so as to ensure the good workmanship and suitable materials of the fixed electrical installation.

8.2 According to the Section 34(6) of the Ordinance, the REC shall effectively supervise a REW employed by him for carrying out the electrical work.

8.3 Under Section 34(11) of the Ordinance, after completion of the electrical work where the Ordinance requires or authorizes a REW to make a report or to certify something, the REC for whom the electrical work is done shall endorse the report or certificate (i.e. Form WR1).

8.4 Under Regulation 22(1) of the Wiring Regulations, a REC shall make and keep all relevant records of electrical work carried out by his employees for the lesser of 5 years or the time since his registration as an electrical contractor.

9. Obligation of Registered Electrical Worker (REW)

9.1 According to Regulation 4(7) of the Wiring Regulations, the REW shall ensure that safety precautions are taken to prevent danger arising from electrical wiring work done by him or under his supervision.

9.2 Under Regulation 19(1) of the Wiring Regulations, the REW shall inspect, test and certify the fixed electrical installation after completion and before it is energized for use to confirm that the requirements of the Ordinance have been met.

9.3 Under Regulation 21(2) of the Wiring Regulations, the REW who carried out the tests and inspections shall record, date and certify the results of tests and inspections.

10. Application of Electricity Supply

10.1 The project owner should submit the electricity supply application directly to the electricity supplier at an early stage of a development. For the details of the application process and the documents that required for the application, the project owner should check with the electricity supplier (i.e. CLP Power Hong Kong Limited and The Hongkong Electric Company Limited).

10.2 After the completion of the electrical work for the buildings/ developments, Form WR1 shall be submitted to the electricity supplier for arranging inspection, connection of electricity supply and installation of meters.

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Electricity Legislation Division
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Flow Chart for the Establishment and Implementation of a Quality Control and Supervision System in MiC/ MiMEP