



CONSTRUCTION
INDUSTRY COUNCIL
建造業議會



Reference Material on the Statutory Requirements For Modular Integrated Construction Projects

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TABLE OF CONTENTS

Disclaimer	1
Acknowledgements	1
Preface	4
Abbreviations	5
Amendment No. 1/2020	7
1. Introduction	10
2. Types of Works/Permits	12
3. Buildings Department.....	16
3.1 Pre-submission Enquiry.....	16
3.2 Pre-acceptance for MiC System	16
3.3 Approval for Specific MiC Project.....	18
3.4 Quality Control and Supervision of MiC	18
3.5 GFA Exemption.....	19
4. Fire Services Department	21
4.1 Fire Service Installations	21
4.2 Design Submission and Approval	21
4.3 Quality Assurance.....	22
4.4 Acceptance Inspection	22
5. Water Supplies Department.....	25
5.1 Design Stage	25
5.2 Before Commencement of Plumbing Works in the MiC Factory	25
5.3 Plumbing Works at the MiC Factory.....	26
5.3.1 Supervision by the LP.....	26
5.3.2 Interim Inspections by WSD.....	27
5.4 Completion of Plumbing Works at the Building Site.....	27
6. Electrical and Mechanical Services Department.....	30
6.1 Fixed Electrical Installations	30
6.2 Safety of Household Electrical Products	31
6.3 Energy Efficiency of Products.....	31
6.4 Gas Supply Installations	33

7. Transport Department.....	36
7.1 Project Planning Stage/Design Stage	36
7.2 Wide Load Permit.....	37
7.3 Procedures for Submitting a Wide Load Permit Application.....	38
7.4 Conditions of a Wide Load Permit	39
7.5 Module Delivery Stage	40
7.6 Q&As on Transport of MiC Modules Including WLP Application.....	40
8. Environmental Protection Department	43
8.1 Project Planning Stage/Design Stage	43
8.2 The CNP System.....	44
8.3 Assessment of Noise.....	45
8.4 Conditions to be Imposed in a CNP	46
8.5 Module Delivery and Installation Stage	46
9. Customs and Excise Department.....	49
9.1 Import and Export Declaration	49
9.2 Cargo Examination	49
Bibliography.....	53
Appendix A - List of Contact Points of Respective Government Departments in Relation to this Reference Material	59
Appendix B - Workflow For Submission and Approval of Plans to Buildings Department and Additional Requirements for MiC.....	60
Appendix C - Workflow For Submission and Approval of Plans to Fire Services Department and Additional Requirements for MiC.....	61
Appendix D1 - Workflow for Submission and Approval of Plans to Water Supplies Department and Additional Requirements for MiC.....	62
Appendix D2 - Record Form for Supervision of Plumbing Works Constructed at MiC Factory.....	63
Appendix E1 – Information Note on Electricity Supply Application.....	64
Appendix E2 - Workflow For Submission and Approval of Plans to Electricity Supplier and Additional Requirements for MiC.....	65
Appendix F1 - Q&As on Transport of MiC Modules Including Wide Load Permit Application	66
Appendix F2 - Advisory Notes on Traffic Impact Assessment for MiC Projects	73

PREFACE

The Construction Industry Council (CIC) is committed to seeking continuous improvement in all aspects of the construction industry in Hong Kong. To achieve this aim, the CIC forms Committees, Task Forces and other forums to review specific areas of work with the intention of producing Alerts, Reference Materials, Guidelines and Codes of Conduct to assist participants in the industry to strive for excellence.

The CIC appreciates that some improvements and practices can be implemented immediately whilst others may take more time for implementation. It is for this reason that four separate categories of publication have been adopted, the purposes of which are as follows:

Alerts	The Alerts are reminders in form of brief leaflets produced quickly to draw the immediate attention of relevant stakeholders to the need to follow some good practices or to implement some preventive measures in relation to the construction industry.
Reference Materials	The Reference Materials are standards or methodologies generally adopted and regarded by the industry as good practices. The CIC recommends the adoption of the Reference Materials by industry stakeholders where appropriate.
Guidelines	The Guidelines provide information and guidance on particular topics relevant to the construction industry. The CIC expects all industry stakeholders to adopt the recommendations set out in the Guidelines where applicable.
Code of Conduct	The Codes of Conduct set out the principles that all relevant industry participants should follow. Under the Construction Industry Council (Cap. 587), the CIC is tasked to formulate codes of conduct and enforce such codes. The CIC may take necessary actions to ensure compliance with the codes.

If you have read this publication, we encourage you to share your feedback with us. Please take a moment to fill out the Feedback Form attached to this publication in order that we can further enhance it for the benefit of all concerned. With our joint efforts, we believe our construction industry will develop further and will continue to prosper for years to come.

ABBREVIATIONS

AP	Authorized Person
AS	Authorized Signatory
BA	Building Authority
BD	Buildings Department
C&ED	Customs and Excise Department
CFL	Compact Fluorescent Lamp
CNP	Construction Noise Permit
DGA	Domestic Gas Appliances
EMAN	Electronic System for Cargo Manifests
EMSD	Electrical and Mechanical Services Department
EPD	Environmental Protection Department
FRC	Fire Resisting Construction
FRR	Fire Resistance Rating
FSD	Fire Services Department
FSI	Fire Service Installations
GBP	General Building Plan
HKPF	Hong Kong Police Force
HyD	Highways Department
IPA	In-principle Acceptance
LBCP	Land Boundary Control Point
LP	Licensed Plumber
MiC	Modular Integrated Construction
MoE	Means of Escape
PCWA	Public Cargo Working Area
PME	Powered Mechanical Equipment
PNAP	Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers
QA	Quality Assurance
QC	Quality Control
REC	Registered Electrical Contractor

REW	Registered Electrical Worker
RFSIC	Registered Fire Service Installation Contractor
RGBC	Registered General Building Contractor
RGC	Registered Gas Contractor
RGI	Registered Gas Installer
RGSC	Registered Gas Supply Company
RMO	Road Management Office
ROCARS	Road Cargo System
RPW	Registered Plumbing Worker
RSC	Registered Specialist Contractor
RSE	Registered Structural Engineer
RW	Registered Worker
TD	Transport Department
TIA	Traffic Impact Assessment
TMLG	Traffic Management Liaison Group
TTM	Temporary Traffic Management
WLP	Wide Load Permit
WSD	Water Supplies Department

AMENDMENT NO. 1/2020

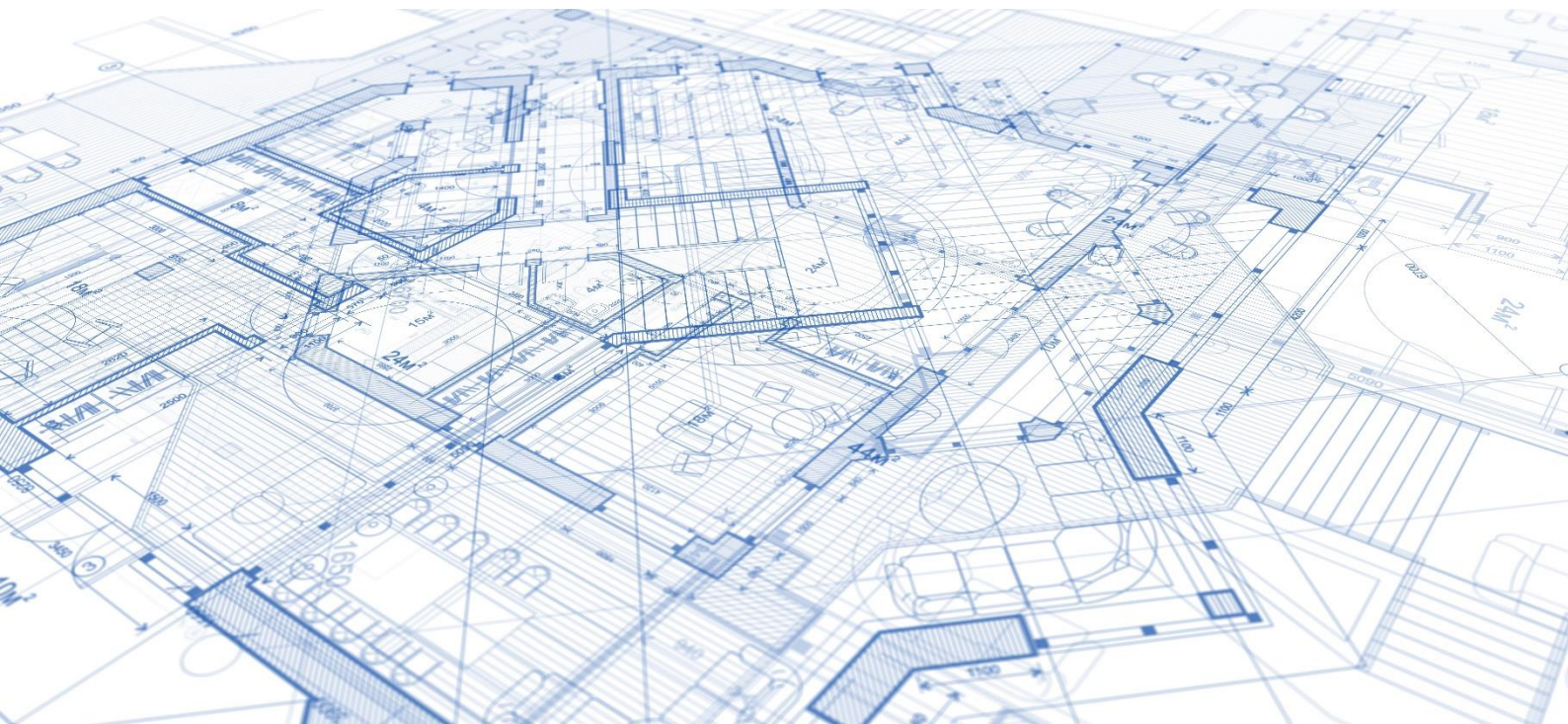
Revised Chapters 1, 3, 5, 7, 8 & 9 for
Guidelines on the Statutory Requirements for MiC Projects (September 2019)
And Renaming of the Publication to
Reference Material on the Statutory Requirements for MiC Projects

Chapter	Department	New/Revised Documents, Guidelines, etc. on MiC Issued by the Respective Department Since September 2019	Amendments Made in the Revised Chapters
1	Introduction	The following document has been revised: (a) PNAP ADV-36 MiC (Sep 2019).	The definition of MiC was amended.
3	Buildings Department	The following documents have been revised/issued: (a) PNAP ADV-36 MiC (Sep 2019) (b) PNAP APP-161 Exemption of GFA for Buildings adopting MiC (May 2019) (c) BD, LandsD & PlanD JPN No. 2 Second Package of Incentives to Promote Green and Innovative Buildings (Sep 2019)	The following revisions have been made: (a) Clarification of the consent application for superstructure works; and (b) GFA exemption details.
4	Fire Services Department	The following document has been issued: (a) FSD Circular No. 1/2020 Revised Application Procedure for Inspection and Testing of Fire Service Installations and Equipment in New Building (Feb 2020)	A new paragraph has been added to Section 4.4 to give details on the revised application procedure for inspection and testing of fire service installations and equipment by FSI/501 submission.
5	Water Supplies Department	(a) The following new thematic webpage on MiC has been included in WSD's website: (https://www.wsd.gov.hk/en/customer-services/application-for-water-supply/water-supply-for-new-buildings-adopting-mic/index.html). (b) Circular Letter No. 2/2019 on Procedures for Applications for Water Supply in New Building Projects adopting "MiC" Method has been subsumed in the relevant sections of WSD's Guide to Application	The chapter has been revamped to cover the different aspects in respect of water supply application that needs to be considered in a MiC project, including the requirements specified in the WSD's new thematic webpage on MiC and the Guide to Application for Water Supply Guidelines issued by WSD.

		for Water Supply issued in Oct 2019 (https://www.wsd.gov.hk/en/plumbing-engineering/requirements-for-plumbing-installation/guide-to-application-for-water-supply/index.html).	
7	Transport Department	The following new guideline has been issued: (a) Guidelines on Application for Wide Load Permit (Nov 2019).	The chapter has been revamped to cover the different aspects in respect of a WLP application that needs to be considered in a MiC project from the Project Planning Stage/Design Stage to the Module Delivery Stage and the requirements specified in the new Guideline issued by TD. Two new documents have also been included as appendices to the chapter. They are (a) Q&As on Transport of MiC Modules Including WLP Applications; and (b) Advisory Notes on Traffic Impact Assessment for MiC Projects. The first document gives answers to some questions generally encountered in a WLP application. The second document covers the aspects that need to be considered in a traffic impact assessment (TIA) and the acceptance criteria.
8	Environmental Protection Department	The following new guideline has been issued: (a) Guidelines on Application of Construction Noise Permit for Using MiC Method (Oct 2019).	The chapter has been revamped to cover the different aspects in respect of a CNP application that needs to be considered in a MiC project from the Project Planning Stage/Design Stage to the Module Delivery and Installation Stage and the requirements specified in the new Guideline issued by EPD. Contacts of the Regional Offices of EPD have been added.
9	Customs and Excise Department		Two new figures have been included to show the locations of the land boundary control points, container/river trade terminals, mid-stream sites and public cargo working areas.

1

Introduction



1. INTRODUCTION

The use of Modular Integrated Construction (MiC) is a growing trend worldwide because of the benefits that MiC brings in terms of controlled engineering processes and enhanced construction safety, quality and productivity.

MiC is an innovative construction method that employs the technique of having freestanding volumetric modules (with finishes, fixtures, fittings, etc.) manufactured off-site and then transported to site for assembly as defined in PNAP ADV-36. By transferring the on-site construction processes to a controlled factory environment, the impacts of adverse weather conditions, scarce labour resources and site constraints that often affect conventional on-site construction methods can be minimised. MiC also enhances construction safety, quality and productivity, reduces construction waste, and helps to reduce nuisances arising from on-site construction due to the reduced site works. It is known that MiC can be more cost-effective than the conventional on-site construction method and can reduce the overall project programme significantly.

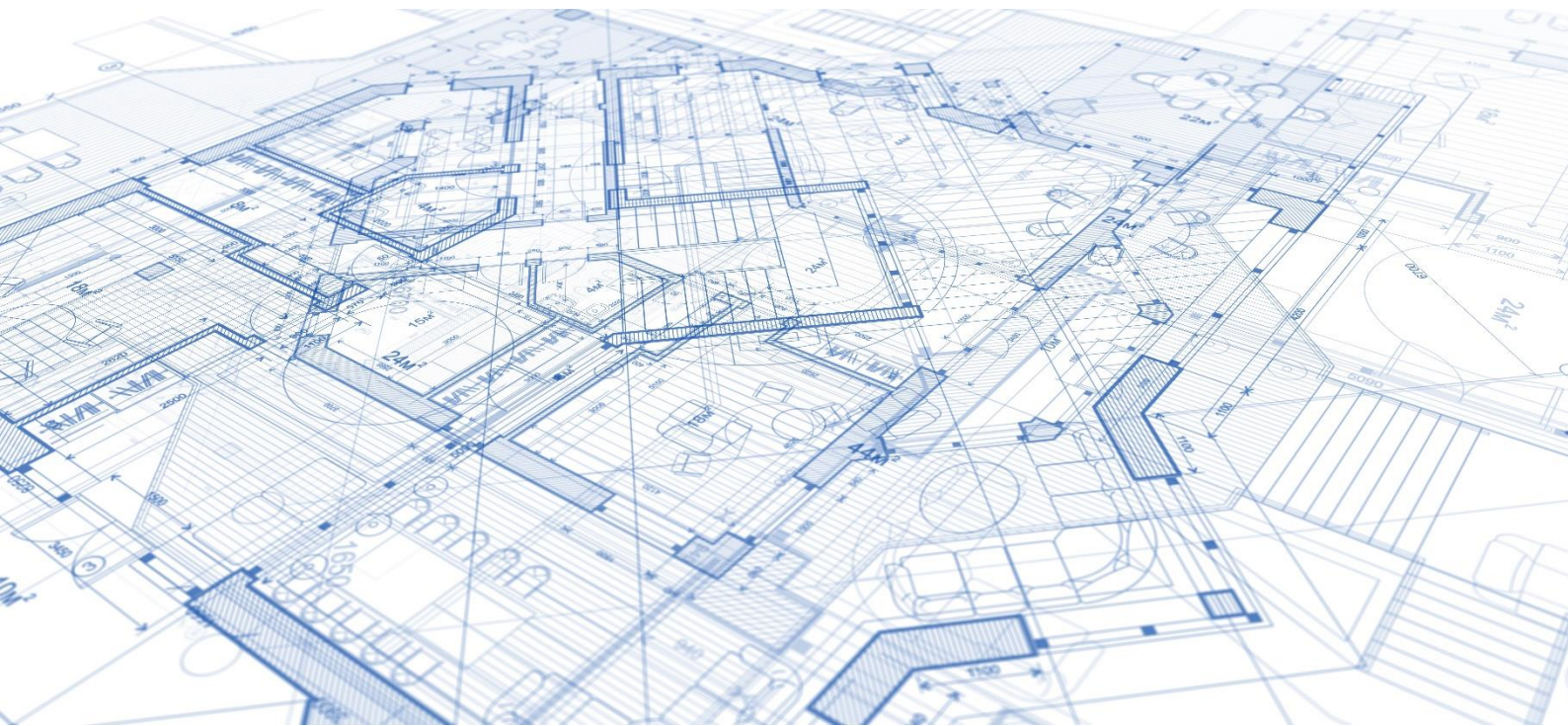
The Development Bureau of the HKSAR Government has promulgated a policy that MiC shall be adopted for new building works¹ with a total construction floor area (CFA) larger than 300 m² under the Capital Works Programme (DEVB, 2020) tendered after 1.4.2020. A list of building types for which use of MiC is mandated or encouraged is included in the circular.

The purpose of this document is to provide information on the statutory requirements imposed by the respective regulatory bodies in Hong Kong, namely the Buildings Department (BD), Fire Services Department (FSD), Water Supplies Department (WSD), Electrical and Mechanical Services Department (EMSD), Transport Department (TD), Environmental Protection Department (EPD) and Customs and Excise Department (C&ED), in respect of MiC projects. The aim is to produce a clear overall picture to the parties concerned to facilitate implementation of their projects.

¹ These include building works funded under Heads 702 to 707, 709 and 711 and Capital Subvention Projects funded under Head 708 of the Capital Works Reserve Fund (CWRP).

2

Types of Works/ Permits



2. TYPES OF WORKS/PERMITS

MiC involves many different types of works, including the following:

- (a) building works;
- (b) ventilating systems;
- (c) Fire Service Installations (FSI) and equipment installation works;
- (d) plumbing works;
- (e) electrical installation works;
- (f) supply and installation of electrical products/appliances; and
- (g) gas installation works.

For the implementation of MiC projects, apart from MiC suppliers, building professionals such as Authorized Persons (AP) and Registered Structural Engineers (RSE) registered under the Buildings Ordinance (Cap. 123) should be engaged to develop, plan, design and supervise the works, and Registered General Building Contractors (RGBC) and Registered Specialist Contractors (RSC) registered under the Buildings Ordinance (Cap. 123) should be engaged to carry out each particular category of works.

The carrying out of the building works should satisfy the requirements under the Buildings Ordinance (Cap. 123) and its subsidiary regulations which set out the structural and fire safety and health standards for the planning, design and construction of buildings. Codes of practice, design manuals and Practice Notes for AP, RSE and Registered Geotechnical Engineers (PNAPs) issued by BD provide guidelines to meet various performance requirements under the Buildings Ordinance (Cap. 123), such as wind effects, dead and imposed loads, use of construction materials, provisions for means of escape (MoE) in case of fire, fire resisting construction (FRC), means of access for firefighting and rescue, and access and facilities for persons with a disability. Such publications are listed in the Bibliography and are available for download at the BD website (<https://www.bd.gov.hk/en/index.html>).

For unconventional designs not matching the Deemed-to-Comply provisions under the codes of practice, justifications have to be provided to demonstrate that the alternative design solutions have equivalent performance as the prescriptive standards (e.g. application of fire engineering according to the framework under the Code of Practice for Fire Safety in Buildings 2011 (BD, 2015) for formulation of an alternative solution to comply with the fire safety objectives).

BD has also promulgated PNAP ADV-36 which sets out the guidelines to facilitate the industry in meeting the relevant standards and requirements under the Buildings Ordinance (Cap. 123) in adopting MiC. Design considerations unique to MiC are given in PNAP ADV-36 for particular attention.

For ventilating systems incorporating the use of ducting or trunking which passes through any wall, floor or ceiling of the building in which the ventilating system is installed, from one compartment of such building to another, the completed works should meet the requirements given in the Building (Ventilating Systems) Regulations (Cap. 123J).

For FSI and equipment, the completed works should satisfy the requirements given in the Codes of Practice for Minimum Fire Service Installations and Equipment and Inspection, Testing, and Maintenance of Installations and Equipment issued by FSD, pursuant to Regulation 10 of the Fire Service (Installations and Equipment) Regulations (Cap. 95B).

The plumbing installations should comply in all respects with the provisions of the Waterworks Ordinance (Cap. 102) and Waterworks Regulations (Cap. 102A) and all prevailing requirements given in the Technical Requirements for Plumbing Works in Buildings issued by WSD.

The fixed electrical installation works should satisfy the Code of Practice for the Electricity (Wiring) Regulations under the Electricity (Wiring) Regulations (Cap. 406E). The supply of electrical products and energy-using products should satisfy the Electrical Products (Safety) Regulation (Cap. 406G) under the Electricity Ordinance (Cap. 406) and the Energy Efficiency (Labelling of Products) Ordinance (Cap. 598) respectively. EMSD has also promulgated guidance notes which set out the guidelines to facilitate the industry in meeting the relevant requirements under the Electricity Ordinance (Cap. 406) and the Energy Efficiency (Labelling of Products) Ordinance (Cap. 598) in adopting MiC.

The gas installation works should meet the requirements stipulated under the Gas Safety Ordinance (Cap. 51) and should satisfy the Codes of Practice in respect of approval of domestic gas appliances (DGA) and flexible tubing for low pressure applications, and installation of domestic gas water heaters where applicable, under the Gas Safety Ordinance (Cap. 51). EMSD has also promulgated guidance notes to provide guidelines on the requirements for the design and installation of gas supply installations in conventional projects and projects with MiC method for use by industry.

The relevant guidance notes on fixed electrical installations, household electrical products, energy label prescribed products and gas supply installations can be accessed via the MiC webpage at the EMSD website (https://www.emsd.gov.hk/en/supporting_government_initiatives/mic/index.html).

The types of RGBC/RSC/Registered Workers (RW) needed for the works are given in Table 2.1.

Table 2.1 – Type of Personnel Required for the Works		
Type of Works	Type of RGBC/RSC/RW	Link
Building works	RGBC registered under the Buildings Ordinance (Cap. 123) (Practice Note for Registered Contractors (PNRC) 38 issued by BD)	https://www.bd.gov.hk/en/resources/online-tools/registers-search/registrationsearch.html
Ventilating systems	RSC (Ventilation Works) registered under the Buildings Ordinance (Cap. 123) (PNRC 38)	
FSI and equipment installation works	Registered FSI contractor (RFSIC) ² registered with FSD	https://www.hkfsd.gov.hk/eng/source/F_SIC_list_eng.pdf
Plumbing works	Licensed Plumber (LP) ³ registered with WSD / Registered Plumbing Worker (RPW)	https://www.wsd.gov.hk/en/plumbing-engineering/licensed-plumbers/index.html
Electrical installation works	Registered Electrical Contractor (REC) /Registered Electrical Worker (REW) ⁴ registered with EMSD	REC https://www.emsd.gov.hk/en/electricity_safety/registers/registered_electrical_contractors/ REW https://www.emsd.gov.hk/en/electricity_safety/registers/registered_electrical_workers/
Gas installation works	Registered Gas Contractor (RGC)/ Registered Gas Installer (RGI) ⁵ registered with EMSD	RGC https://www.emsd.gov.hk/en/gas_safety_registers/ RGI https://www.emsd.gov.hk/en/gas_safety_registers/registered_gas_installers_search/

The types of permits/clearance that may need to be obtained in respect of MiC projects include a Wide Load Permit from TD, Construction Noise Permit from EPD and customs clearance from C&ED.

A list of the contact points of the respective Government departments in relation to this Reference Material is given in Appendix A.

² Registered FSI Contractors are contractors registered under the Fire Service (Installation Contractors) Regulations (Cap. 95A).

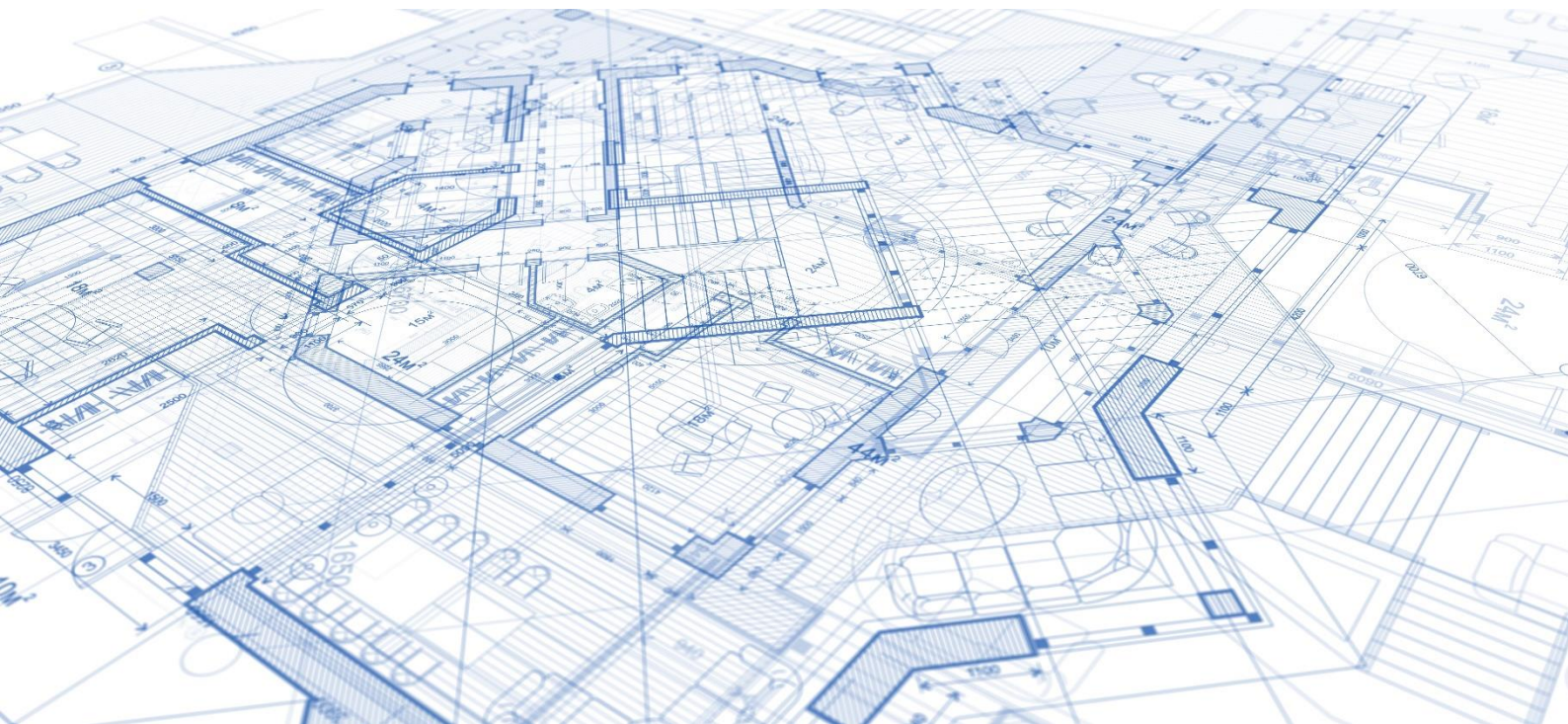
³ Licensed Plumbers are persons licensed under the Waterworks Ordinance (Cap. 102) to construct, install, maintain, alter, repair or remove fire services or inside services.

⁴ Registered Electrical Contractors and Registered Electrical Workers are contractors and persons respectively registered under the Electricity (Registration) Regulations (Cap. 406D).

⁵ Registered Gas Contractors and Registered Gas Installers are contractors and persons respectively registered under the Gas Safety (Registration of Gas Installers and Gas Contractors) Regulations (Cap. 51D).

3

Buildings Department



3. BUILDINGS DEPARTMENT

3.1 Pre-submission Enquiry

The established pre-submission enquiry service of BD set out under PNAP ADM-19 allows an AP/RSE to settle the design principles involved at an early stage, before preparing detailed designs. BD may hold pre-submission conferences with the AP/RSE and, if necessary, invite representatives of the concerned Government departments, RGBC and MiC suppliers to discuss and examine the issues and principles involved. A determination will normally be given within 45 days.

3.2 Pre-acceptance for MiC System

To further facilitate the use of MiC in local private projects, BD has set up a pre-acceptance arrangement for granting in-principle acceptance (IPA) of individual MiC systems/components on specific performance. The pre-acceptance mechanism aims to resolve the non-site specific design and construction matters of an MiC system/component and provide a curtailed assessment on whether the design and materials used meet certain minimum standards for a particular aspect set out under the Buildings Ordinance. The application may cover a single module or a combination of various modules forming a typical floor and a building block, including the associated standard structural and connection details. Essential information which should be contained in the application is given in PNAP ADV-36. A determination will be given within 45 days.

An MiC system accepted by BD will be assigned a unique IPA reference number, which will be included in the IPA list in the BD website and should be quoted in the formal plan submissions for a specific MiC project. General information about the accepted MiC systems/components can be found at the BD website (<https://www.bd.gov.hk/en/resources/codes-and-references/modular-integrated-construction/mic-acceptedList.html>). To cater for advancements in construction technology and possible revision to codes of practice, the IPA of any MiC system is subject to a validity period of a maximum of 5 years.

The IPA of the MiC systems may cover certain performance aspects set under the Buildings Ordinance, for example:

- (a) MoE provisions;
- (b) FRC provisions;
- (c) construction of external wall and cladding;
- (d) provisions of natural lighting and ventilation;
- (e) sanitary fitments and associated drainage works;
- (f) structural system and design loads;

- (g) provisions for structural performance of the modules (including material specifications and compliance standards, corrosion and fire protection of structural elements);
- (h) Quality Assurance Scheme and certification; and
- (i) fabrication, logistics, assembly and installation.

For the pre-accepted MiC systems, the checking is based on specific assumptions made by the applicants in respect of building height, integration with cast in-situ structural elements, wind pressure, imposed loads, superimposed loads and facade loads, and cover:

- (a) vertical and lateral load transfer mechanism;
- (b) structural stability, including lateral stability;
- (c) robustness and structural integrity;
- (d) capacity of structural connections between modules, and between modules and cast in-situ structural elements;
- (e) design for temporary stages (lifting, storage, installation, etc.), including the design of lifting frames, if any;
- (f) durability and workmanship requirements;
- (g) fabrication and installation tolerance of modules;
- (h) movement joint between modules and in-situ parts to allow for thermal and shrinkage effects;
- (i) structural analysis;
- (j) overall stability;
- (k) adequacy of structural members and/or structural connections; and
- (l) lateral deflection.

The IPA will be granted subject to the following conditions, among others:

- (a) intended use, height and storey of the building adopting the MiC system;
- (b) provision of supplementary documentary proof of materials/components having the required Fire Resistance Rating (FRR) before actual production in the MiC factory;
- (c) provision of access points for inspection/maintenance/repair of building services and construction elements in accordance with the accepted plans; and
- (d) provision of a user manual to owners/occupants/users of the building adopting the MiC system, to include maintenance and building safety instructions for future fitting, decoration, alterations and additions to the MiC system.

There are benefits in adopting pre-accepted MiC systems if they meet the size, height and material requirements and other design requirements of the project because the material used, connection capacity and other technical aspects of the modules have been checked by

BD to meet the minimum standards set out under the Buildings Ordinance. It also helps to streamline the workflow and facilitate the plan approval process of private development projects. If suitable pre-accepted MiC systems are not available, the project proponents are highly recommended to appoint a competent MiC supplier at an early stage of the development.

3.3 Approval for Specific MiC Project

Similar to a project adopting conventional design and on-site construction, the AP and RSE of an MiC project are required to prepare and submit the General Building Plan (GBP) and other necessary plans (such as superstructure plan and drainage plan) to BD for approval in accordance with the principles and guidelines given in PNAP ADM-19. The plans will be handled under the centralised processing system as stipulated in PNAP ADM-2, through which all interested government departments will be consulted and their comments will be collated by BD. For a project adopting an MiC system with IPA granted by BD, the application for approval will be considered with due regard to the various performance aspects that have already been pre-accepted together with the conditions imposed. Re-assessment of the same aspects will not be made, unless it is proposed to use alternative design and materials/construction methods which deviate materially from the accepted system/component or testing criteria of the accepted test reports.

If the MiC system proposed is not on the IPA list, detailed design, analysis and supporting documents similar to those listed in Section 3.2 are required for assessment, in order to justify the performance and technical aspects of the MiC system. While pre-acceptance is not a pre-requisite for the approval of a GBP, any MiC details not yet available at the initial design stage may be submitted later for assessment and should be accepted prior to factory production.

A workflow for submission and approval of plans for MiC projects is provided in Appendix B.

3.4 Quality Control and Supervision of MiC

Modules are to be fabricated by a factory with ISO 9000 or equivalent quality assurance certification. Upon approval of plans, requirements will be imposed under item 6 in Section 17(1) of the Buildings Ordinance and regulation 10 of the Building (Administration) Regulations to: (i) specify the qualified supervision to be provided by the AP, RSE and RGBC for the fabrication, assembly, installation and examination of modules and pre-installed finishes; and (ii) require submissions of an MiC supervision plan and the MiC supplier's Quality Assurance Scheme at least 14 days before commencement of the production work in the factory. Consent to commence superstructure works should be obtained before the

installation of modules on building site. Detailed requirements on quality control and supervision of MiC works are given in PNAP ADV-36.

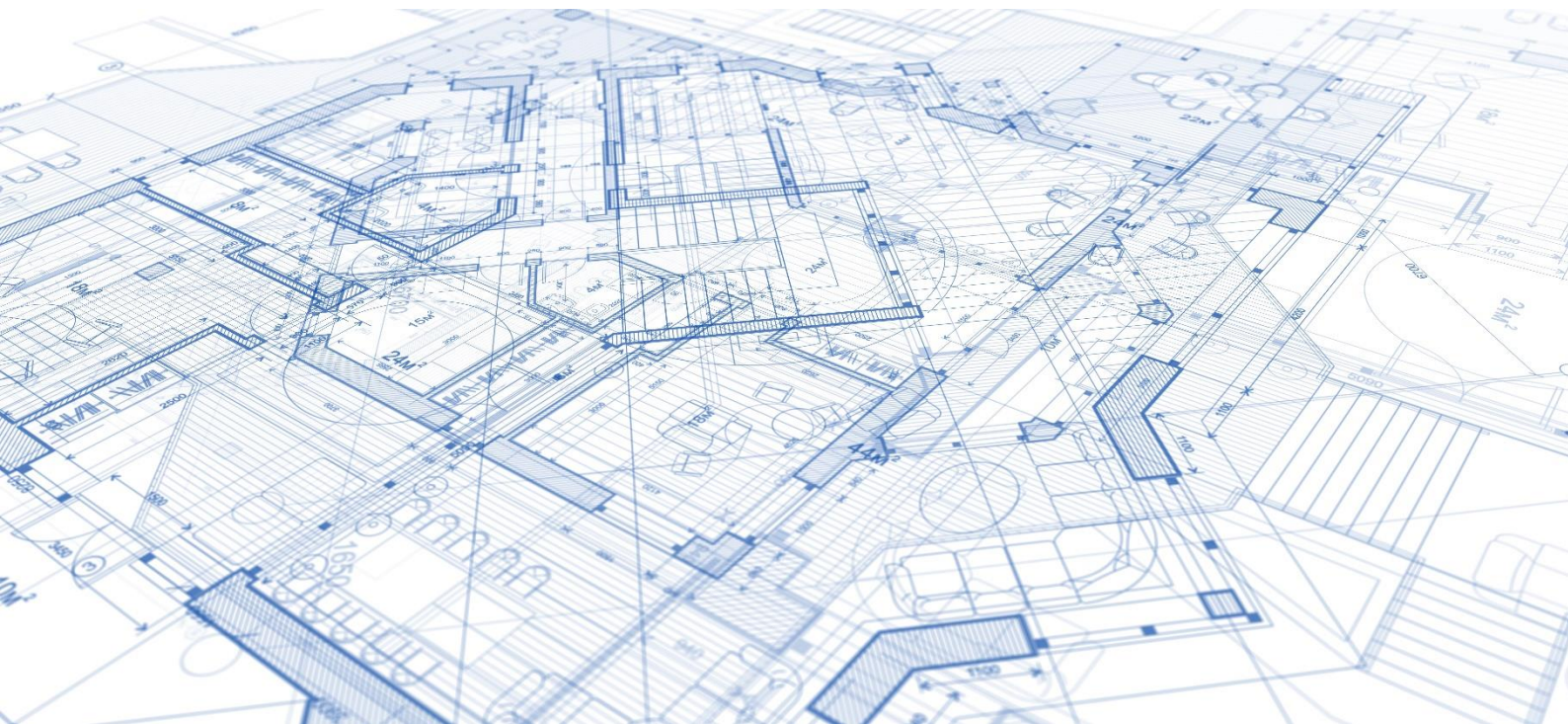
3.5 GFA Exemption

To encourage wider use of MiC in new buildings, the Building Authority is prepared to grant the following gross floor area (GFA) exemptions as promulgated in PNAP APP-161 (BD, 2019b):

- (a) 6% of the MiC floor area of a new building may be disregarded from the GFA of the development upon submission of an application for exemption under Section 42 of the Buildings Ordinance; and
- (b) The disregarded GFA under item (a) above is not subject to the overall GFA cap of 10% under PNAP APP-151.

4

Fire Services Department



4. FIRE SERVICES DEPARTMENT

4.1 Fire Service Installations

The procedure in meeting the standards and requirements of Fire Service Installations (FSI) and Equipment is divided into two stages: Design Submission and Approval, and Acceptance Inspection (see FSD Circular Letter No. 1/2005, FSD Circular Letter No. 1/2015, FSD Circular Letter No. 3/2019 and FSD Circular Letter No. 1/2020⁶). The procedure for submission of FSI plans at the Design Submission and Approval Stage and as-fitted layout plans at the Acceptance Inspection Stage for MiC projects follows that for conventional building projects, as shown in the workflow in Appendix C.

4.2 Design Submission and Approval

Under the centralised processing system as stated in PNAP ADM-2, BD will refer FSI plans to FSD for processing.

The design of the FSI should be based on the Code of Practice for Minimum FSI and Equipment and Inspection, Testing, and Maintenance of Installations and Equipment issued by FSD, pursuant to Regulation 10 of the Fire Service (Installations and Equipment) Regulations (Cap. 95B). An AP/Registered FSI Contractor (RFSIC) should be engaged to resolve issues not usually encountered in conventional on-site construction.

The AP should clearly indicate in the F.S. Notes of the GBP that the building is to be constructed using the MiC method and highlight in the corresponding covering letters that the MiC method will be adopted.

The following design considerations should be made during the design of FSI of MiC building projects:-

- (a) provision of adequate access points, inspection pits or accessible recesses for covered up installations for inspection, testing and future maintenance;
- (b) use of flexible pipe jointing between modules, where required, for services connection;
- (c) use of cabling facilities for FSI between modules for on-site installations of power and control cables; and
- (d) use of FSI equipment and materials accompanied with product listing certificates/records/letters issued by the respective product certification bodies accepted/approved in accordance with FSD Circular Letter No. 1/2007.

⁶ https://www.hkfsd.gov.hk/eng/fire_protection/notices/circular.html

If the plans are acceptable, FSD will issue a standard letter or a Fire Services Certificate (FS 161), and return one set of the endorsed plans to the AP/RFSIC. If the plans are acceptable subject to minor changes, the AP/RFSIC will be invited by FSD to make the necessary amendment. If the plans are not acceptable, FSD will retain one set of the plans and issue a letter to the AP/RFSIC notifying them of the adverse comments and to collect the remaining set of plans from FSD.

The processing time of FSI plans for approval is 20 working days.

4.3 Quality Assurance

It is the responsibility of the RFSIC to ensure that FSI are installed/constructed in compliance with the approved plans, relevant statutory requirements, and the Code of Practice for Minimum FSI and Equipment and Inspection, Testing, and Maintenance of Installations and Equipment. To ensure quality at the MiC factory, the RFSIC should:

- (a) conduct regular supervision in the fabrication process to ensure that the equipment and materials used in FSI are in full compliance with relevant statutory requirements; and
- (b) keep an inspection log book, including names and registration numbers (FSD/RC No.) of the RFSIC responsible for conducting the quality assurance supervision, and details of the inspection, auditing and testing of the off-site FSI works at the MiC factory, and provide the log book to FSD when required. Use of appropriate digital technologies will facilitate such work.

At the building site, after the modules are delivered to site and before the on-site assembling process, the RFSIC should check and inspect the FSI installed in the integrated modules, especially if there is concern over possible damage during transit and difficulty in replacing/repairing the installed FSI after assembly. The RFSIC is also advised to monitor the on-site assembling process to ensure proper fixing of the FSI elements.

4.4 Acceptance Inspection

After the FSI have been installed, the AP should submit the following documents and request FSD to carry out acceptance inspection of the FSI and equipment installed at the building as given in FSD Circular Letter No. 1/2015, FSD Circular Letter No. 3/2019 and FSD Circular No. 1/2020, following the same procedures used for new conventional buildings:

- (a) Application Form FSI/501 (Application for Inspection and Testing of Fire Service Installations and Equipment);

- (b) Certificate FSI/501a (Certificate of Completion of Installation of Fire Service Installations and Equipment in New Buildings);
- (c) Form FSI/314 with two sets of as-fitted FSI layout plans;
- (d) a schedule of the submitted FSI layout plans;
- (e) testing and commissioning checklists as given in FSD Circular Letter No. 1/2015;
and
- (f) a FSI equipment list.

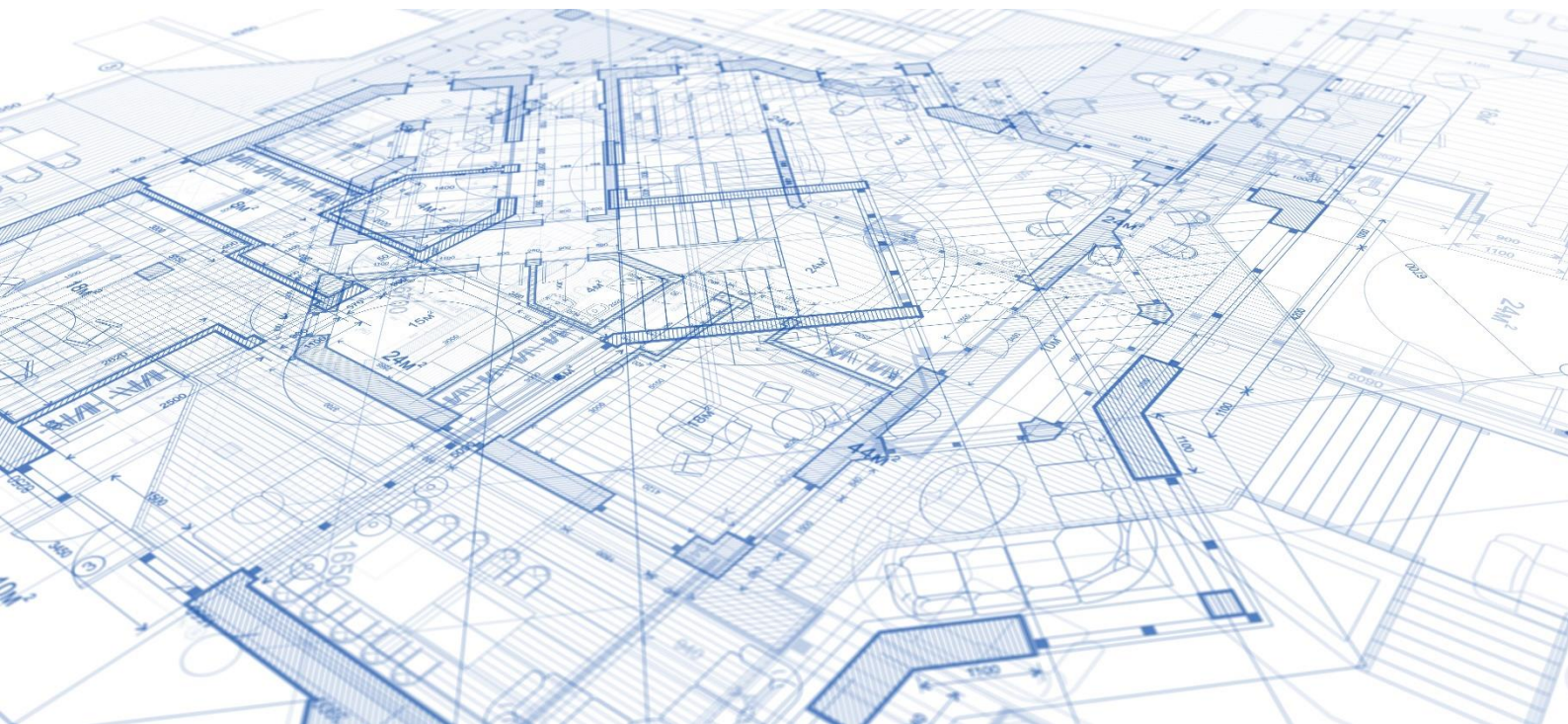
With effect from 1.5.2020, Form FSI/501 should be tendered by an AP after certification at Part B of the form. The completed FSI/501 should be submitted together with, inter alia, duly signed FSI/501a provided by the RFSIC. For FSI in a new building involving staircase pressurization system, dynamic smoke extraction system, water mist system or other FSI falling under the RPE's purview, certification by a RPE at Part A of FSI/501 is also needed.

Provision of digital records, including photographs and videos taken during inspection and testing, will facilitate the acceptance inspection by FSD.

FSD will arrange acceptance inspection within 15 working days after receipt of the application. FSD will issue Form FS 172 for non-government buildings, or an acceptance memo/letter for government buildings, after confirming that the installed FSI are in full compliance with the FS requirements.

5

Water Supplies Department



5. WATER SUPPLIES DEPARTMENT

5.1 Design Stage

In applying for water supply for MiC projects, the procedure basically follows that for conventional building projects. Some additional requirements as detailed in WSD's website on Water Supply for New Buildings adopting Modular Integrated Construction (MiC) (see <https://www.wsd.gov.hk/en/customer-services/application-for-water-supply/water-supply-for-new-buildings-adopting-mic/index.html>) should be followed (as summarised in the workflow in Appendix D1). Reference should also be made to Sections 3.12, 4.1.3, 4.2A, 4.3.2A and 4.3.3A and Appendices 2 and 26 of the Guide to Application for Water Supply⁷.

The applicant should check the lease conditions of the development site to confirm that the mains water supply would be available. The applicant should then write to WSD and indicate briefly the development's requirements for water supply, together with a block plan showing the exact plumbing locations.

If provision of water supply is found feasible, WSD will send details of the requirements to the applicant for preparation of a plumbing proposal.

The following should be submitted to WSD for approval:

- (a) Application Form WWO 542;
- (b) plumbing proposal;
- (c) a list of pipes and fittings intended to be installed (using Form WWO 1149) if a licensed plumber (LP) has already been appointed by the contractor at this stage; and
- (d) Vertical Plumbing Line Diagram (VPLD) including sections showing the plumbing works to be installed at the MiC factory.

5.2 Before Commencement of Plumbing Works in the MiC Factory

Prior to commencement of the plumbing works in the MiC factory, the LP is required to submit the following to WSD for agreement:

- (a) Form WWO 46 (Parts I and II). Form WWO 1149 should be submitted, if it has not been previously submitted.

⁷ <https://www.wsd.gov.hk/en/plumbing-engineering/requirements-for-plumbing-installation/guide-to-application-for-water-supply/index.html>

- (b) Supervision Plan. The plumbing works should be installed under the instruction and supervision of the LP⁸ and Registered Plumbing Worker (RPW)⁹. The supervision plan should include:
 - (i) the name, proof of relevant qualification, supervision frequency and supervision period of the LP and RPW,
 - (ii) the name, address and contact details of the responsible contact person at the MiC factory, and
 - (iii) the types and frequencies of the supervision checks and tests to be carried out.
- (c) Shop Drawings. These drawings should show the details of the plumbing works in the modules that will be covered up in the MiC factory, which cannot be exposed easily after assembly of the modules at the building site.
- (d) Production Schedule. A production schedule for the modules, as well as the production schedule and the corresponding inspection schedule for the plumbing works to be covered up as indicated in the shop drawings, should be provided. This will allow the WSD's Inspection Agent to arrange interim inspections of the plumbing works before the concealed parts are covered up.

WSD will issue Form WWO 46 (Part III) to give consent to the commencement of works if there is no objection.

It is stated in the Waterworks Regulations (Cap. 102A) that “No pipe or fitting forming part of a fire service or inside service shall be used or covered up until it has been inspected and approved by the Water Authority”. Hence, items (c) and (d) above are particularly important for the parts of plumbing works to be covered up in the MiC factory, but which cannot be subsequently exposed easily for inspection and non-destructive tests after assembly at the building site in Hong Kong. It is important for the designer to include in the design access points for inspection of all pipes and fittings forming part of a fire service or inside service in the modules, to facilitate the subsequent inspection by WSD.

5.3 Plumbing Works at the MiC Factory

5.3.1 Supervision by the LP

The responsible LP should ensure that supervision checks and tests are conducted for the plumbing works in accordance with the supervision plan agreed by WSD. Proper supervision records should be kept, including the date and time of inspection and supervision checks and tests conducted by the LP and RPW. A sample supervision record is given in

⁸ The responsible LP who submits Form WWO 46 for the plumbing works to be constructed in the MiC factory.

⁹ The definition of a RPW is given in Part 1 of the Schedule of the Waterworks Ordinance.

Appendix D2 for reference. The supervision records shall be submitted to WSD for inspection when required. The responsible LP will be required to declare that the plumbing works carried out at the MiC factory have been supervised according to the supervision plan, and the works comply with the provisions of the Waterworks Ordinance (Cap. 102) and Waterworks Regulations (Cap. 102A) and the prevailing Technical Requirements for Plumbing Works in Buildings¹⁰.

Provision of robust digital supervision records, including photographs, videos and details of the supervision personnel who undertook the inspection checks and tests, will facilitate the acceptance by WSD.

5.3.2 Interim Inspections by WSD

For plumbing works to be covered up as indicated in the shop drawings, WSD will arrange an Inspection Agent to carry out interim inspections before the concealed parts are covered up to ensure that they comply in all respects (including but not limited to the aspects of material and size of pipes and fittings as well as their jointing method) with the legal requirements. The Inspection Agent will conduct inspection checks and carry out non-destructive tests to determine the lead content in the solder joints for the plumbing works. The responsible LP or his/her representative should witness all interim inspections such that any non-compliance identified by the Inspection Agent during the inspections can be immediately followed-up. The Inspection Agent will advise the responsible LP or his/her representative immediately after such inspection if the plumbing works to be covered up are found to be in order.

The Inspection Agent will also carry out audit checks of the LP's supervision records.

The responsible LP should coordinate and liaise with the WSD Inspection Agent regarding the exact inspection dates and times of the plumbing works to be covered up. If the in-factory inspection frequency so warrants, the responsible LP should arrange a working place at the MiC factory for the Inspection Agent to station its resident staff for conducting the interim inspections, and/or adopt digital technologies for joint witnessing of the inspection checks and tests required and the preparation of supervision records.

5.4 Completion of Plumbing Works at the Building Site

The applicant for water supply for the project should notify WSD upon completion of the plumbing works at the building site in Hong Kong using Form WWO 46 (Part IV). WSD

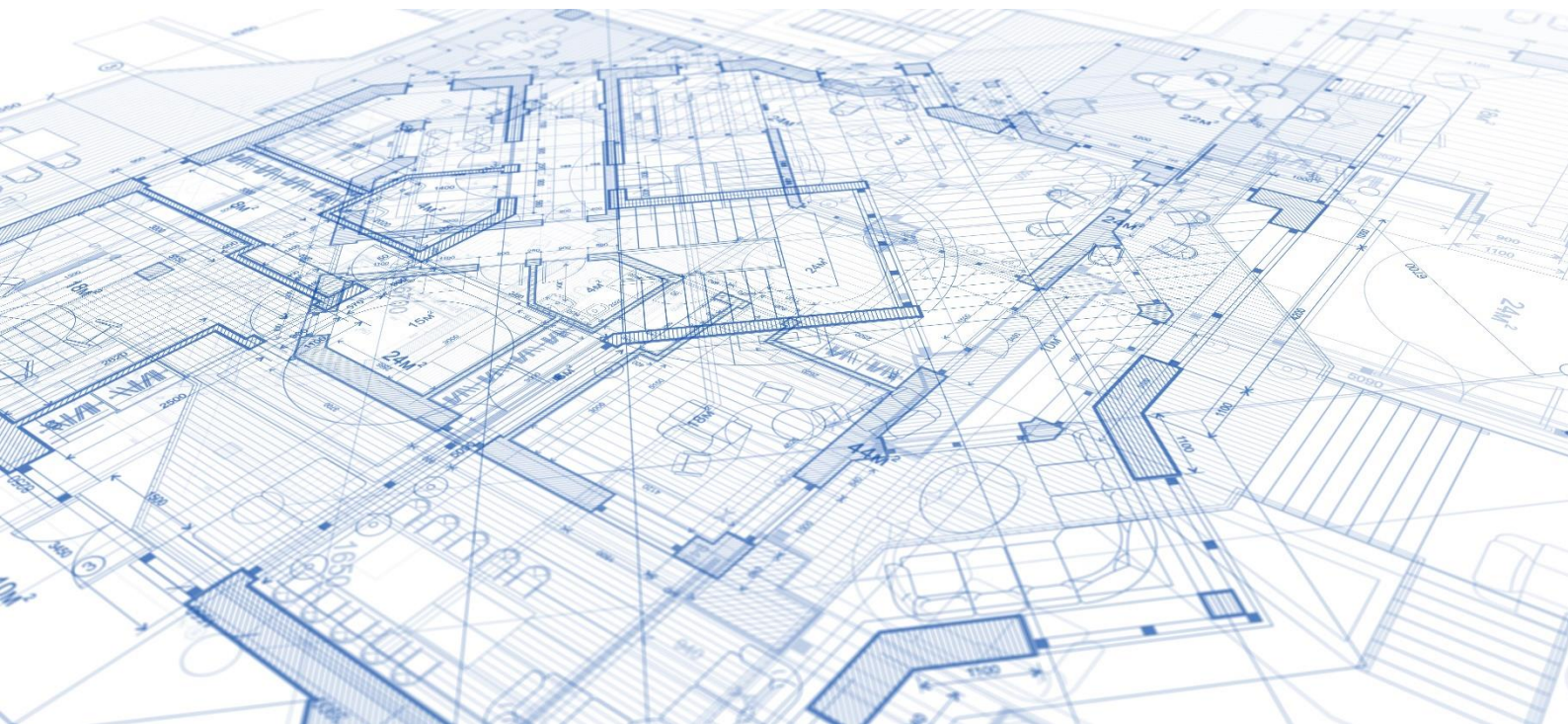
¹⁰ https://www.wsd.gov.hk/filemanager/en/content_1804/technical-requirements-for-plumbing-works-in-buildings-e.pdf

will conduct final inspection of the completed plumbing works that are/can be exposed. Approval of the plumbing works will be granted by WSD subject to:

- (a) satisfactory results of the final inspection by WSD,
- (b) satisfactory results of the interim inspections by the WSD's Inspection Agent of the concealed parts of the plumbing works before they are covered up in the MiC factory (in which case no opening up of the concealed plumbing works for inspection will be required at the building site), and
- (c) compliance with the commissioning requirements specified by WSD.

6

Electrical and Mechanical Services Department



6. ELECTRICAL AND MECHANICAL SERVICES DEPARTMENT

6.1 Fixed Electrical Installations

The procedure for provision of fixed electrical installations for MiC projects follows that for conventional new buildings.

The statutory requirements imposed by EMSD under the Electricity Ordinance (Cap. 406) are that all electrical work should be carried out by a Registered Electrical Contractor (REC) and the REC should employ appropriate grades of Registered Electrical Workers (REWs) for the work. Electrical work refers to 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 the work and the design of the installation. REC/REW should follow the technical requirements given in the Code of Practice for the Electricity (Wiring) Regulations¹¹ to design, construct, install, inspect and test the fixed electrical installations. A fixed electrical installation refers to a low or high voltage electrical installation (e.g. distribution boards, wiring installations and lighting fittings, etc.) that is fixed to the premises, but it does not include any electrical equipment supplied with electricity after passing through a socket of the installation at which the supply can be disconnected without the use of a tool.

Upon completion of the installation of electrical work in the premises, and before the installation is energized for use, the responsible REC and REW should have the installation inspected, tested and certified using the Work Completion Certificate (Form WR1) to confirm that the requirements of the Electricity Ordinance (Cap. 406) have been met. The REC should submit the Work Completion Certificate (Form WR1¹²) as proof of compliance with the Electricity Ordinance (Cap. 406) to the electricity supplier. Inspection of the electrical installation will be conducted by the electricity supplier prior to connection of electricity supply to the installation. The Work Completion Certificate (Form WR1) should be supported with relevant test records, plan and other documents, and the documents should be kept for at least 5 years and produced for inspection by EMSD upon request. To effectively monitor the standard of electrical work, EMSD will carry out random inspection of electrical installations that are designed, installed or tested by the REC at the building site. Copies of relevant test records, plans and documents should be made available for checking by EMSD as required.

¹¹ https://www.emsd.gov.hk/en/electricity_safety/new_edition_cop_electricity_wiring_regulations/index.html

¹² https://www.emsd.gov.hk/filemanager/en/share/electricity_safety/public_forms/wr1.pdf

A Guidance Note on Fixed Electrical Installations with Modular Integrated Construction Method¹³ is available which provides guidance on the requirements for the design, construction and installation of fixed electrical installations in MiC buildings/developments.

An Information Note on the procedures and relevant details of electricity supply application from electricity suppliers is given in Appendix E1.

6.2 Safety of Household Electrical Products

Household electrical products supplied in MiC projects, e.g. television sets, refrigerators, electric water heaters, etc., are regulated by the Electrical Products (Safety) Regulation (Cap. 406G) under the Electricity Ordinance (Cap. 406). Under the Regulation, the categories of persons that are regarded as suppliers are wide ranging, and include manufacturers, importers, wholesalers, retailers, etc., if such persons supply household electrical products in Hong Kong. Property developers may also be regarded as suppliers, as the Regulation also applies to the supply of household electrical products as part of or in connection with a disposition of any premises, if such a disposition, which includes a sale, lease, licence and permission to occupy, is the first disposition made prior to the first occupation of the premises.

Suppliers should ensure that the household electrical products comply with the applicable safety requirements of the Regulation, and the products should have been issued with valid certificates of safety compliance, as detailed in the Guidance Notes for the Electrical Products (Safety) Regulation¹⁴.

A Guidance Note on Household Electrical Products with Modular Integrated Construction Method¹⁵ is available which provides guidance on the requirements for the supply of household electrical products at integrated modules in MiC projects.

6.3 Energy Efficiency of Products

The supply of prescribed products in MiC projects are regulated by the Energy Efficiency (Labelling of Products) Ordinance (Cap. 598). Currently, the Ordinance covers eight types of prescribed products, namely room air conditioners, refrigerating appliances, compact fluorescent lamps (CFLs), washing machines, dehumidifiers, televisions, storage type electric water heaters and induction cookers. Under the Ordinance, a prescribed product

¹³ https://www.emsd.gov.hk/filemanager/en/content_444/GN_FEI_Modular_Integrated_Construction_Method.pdf

¹⁴ https://www.emsd.gov.hk/filemanager/en/content_444/GN-ElectricalProductsSafetyRegulation2019.pdf

¹⁵ https://www.emsd.gov.hk/filemanager/en/content_444/GN_HEP_Modular_Integrated_Construction_Method.pdf

supplied by an importer or Hong Kong manufacturer should be a listed model having a reference number assigned in the supplier's name by EMSD and bear an energy label that complies with the specified requirement. Any other supplier who is not an importer or Hong Kong manufacturer should ensure that prescribed products are listed models with a reference number and bear an appropriate energy label.

A contractor may purchase prescribed products from Mainland/overseas supplier or manufacturer for installation at the integrated module. Irrespective of whether the product model is a listed model or a non-listed model under the Ordinance, the contractor who imports the integrated module with the prescribed product should be the importer of the product model. The importer should submit the product information, including an energy performance test report of the product model issued by an accredited testing laboratory, to EMSD for assignment of a reference number. Energy labels should also be attached or affixed to the products before being supplied in Hong Kong. The Guideline on Submission of Product Information¹⁶ and Code of Practice on Energy Labelling of Products¹⁷ provide practical guidance and technical details about the energy efficiency labelling of prescribed products. The target response time for submission of product information under the Mandatory Energy Efficiency Labelling Scheme is 17 working days.

Alternatively, the contractor may purchase prescribed products from a Hong Kong importer (i.e. the specified person to whom a reference number for the prescribed product under the Ordinance has been assigned) for installation at the integrated module. The prescribed product should be a listed product model, and bear an energy label.

A person other than a Hong Kong importer (e.g. project agent, integrated module owner, private developer, etc., depending on the contract arrangement) should not supply prescribed products unless the products are listed product models, which bear an energy label.

The Guidance Note on Supply of Energy Label Prescribed Products at Modular Integrated Construction (MiC) Projects¹⁸ provides guidance on the requirements in the supply of prescribed products at integrated modules in MiC projects.

Details of the energy efficiency labelling of products in Hong Kong can be found at the EMSD website from the following link: <https://www.emsd.gov.hk/energylabel>.

¹⁶ <https://www.emsd.gov.hk/energylabel/en/apply.html>

¹⁷ <https://www.emsd.gov.hk/energylabel/en/cop.html>

¹⁸ [https://www.emsd.gov.hk/energylabel/en/doc/Guidance%20Note%20on%20Supply%20of%20Prescribed%20Products%20at%20MiC%20Projects_ENG\(201906\).pdf](https://www.emsd.gov.hk/energylabel/en/doc/Guidance%20Note%20on%20Supply%20of%20Prescribed%20Products%20at%20MiC%20Projects_ENG(201906).pdf)

6.4 Gas Supply Installations

The procedure for provision of gas supply installations in MiC projects follows that for conventional new buildings. The Gas Authority of EMSD is responsible for the enforcement of the Gas Safety Ordinance (Cap. 51) and acts as the regulator on gas safety in Hong Kong.

Gas installation work refers to the fabrication, connection, disconnection, testing, commissioning, decommissioning, maintenance, repair or replacement of gas pipes, gas fittings and gas appliances, etc., but it does not include the connection/disconnection of a cylinder or a bunsen burner. The requirements imposed by EMSD under the Gas Safety Ordinance are that all gas installation works conducted in Hong Kong, including the installation, testing and commissioning of gas pipes/fittings/gas appliances in buildings, installation, testing and commissioning of gas pipes/fittings in the MiC modules, and assembling of pre-laid gas pipes/fittings in MiC modules, should be carried out by a Registered Gas Installer (RGI) of an appropriate class, who is a Registered Gas Contractor (RGC) or employed by a RGC. The gas installation works carried out by a RGC/RGI should comply with the Gas Safety Ordinance, and conform to the relevant Codes of Practices¹⁹ and guidance notes²⁰ issued by the Gas Authority, and the operating procedures issued by the relevant Registered Gas Supply Company (RGSC). The Guidance Note on Gas Supply Installations²¹ provides guidance on the requirements for the design and installation of gas supply installations in conventional and MiC projects.

In addition, all domestic gas appliances (DGA) imported, supplied and installed for use in Hong Kong should be of the type approved by the Gas Authority, in accordance with the Gas Safety (Miscellaneous) Regulations (Cap. 51F) and Code of Practice GU05 – Approval of Domestic Gas Appliances²². These include gas appliances designed for or intended to be primarily used in domestic premises, irrespective of whether it is so used (e.g. gas cookers, gas water heaters and clothes dryers). Approved DGA should bear a “GU” Mark. A list of the approved models can be found at the EMSD website from the following link: https://www.emsd.gov.hk/en/gas_safety/registers/.

The flexible gas tubing (either imported or manufactured) for use in Hong Kong for low-pressure applications (supply pressure not exceeding 7.5kPa) should also be approved by the Gas Authority, in accordance with the Gas Safety (Miscellaneous) Regulations (Cap. 51F) and Code of Practice GU01 – Approval of Flexible Gas Tubing for Low Pressure

¹⁹ https://www.emsd.gov.hk/en/gas_safety/publications/codes_of_practice/index.html

²⁰ https://www.emsd.gov.hk/en/gas_safety/publications/guidance_notes/index.html

²¹ https://www.emsd.gov.hk/filemanager/en/content_287/Guidance_Note_on_Gas_Supply_Installations.pdf

²² https://www.emsd.gov.hk/filemanager/en/content_286/gas_approval.pdf

Applications²³. Also, the installation requirements for domestic gas water heaters (up to 70 kW) are given in Code of Practice GU03²⁴.

An AP or contractor, who intends to pre-install a DGA in the MiC module at workshops in the Mainland of China or overseas countries for use in Hong Kong, should engage an importer who has obtained the Gas Authority's approval of that particular brand and model of DGA for importation under the "Approval Scheme for Domestic Gas Appliances" of EMSD. Alternatively, the AP or contractor may apply for the Gas Authority's approval to import any DGA under the Scheme in accordance with the Code of Practice GU05. The connection, testing and commissioning of DGAs in Hong Kong shall be carried out by a RGI of the appropriate class of gas installation work and employed by a RGC.

The RGC should ensure that the gas installation works, including the installation of gas pipes/fittings in the MiC modules for use in Hong Kong, are properly carried out with safe and sound materials that conform to the Gas Safety Ordinance and Guidance Note on Gas Supply Installations. For the gas installations in the MiC modules installed at workshops locally or outside Hong Kong, the RGC is recommended to liaise with the AP/developer/MiC contractor/RGSC as early as practicable for the establishment and implementation of a quality control and supervision system to ensure that the gas installations will be installed, inspected and tested at the workshops with good workmanship and suitable materials.

Prior to commissioning of the gas installations and DGAs, the RGC should ensure that a soundness test and purging associated with those gas installations are satisfactorily completed, in compliance with the Gas Safety (Gas Supply) Regulations (Cap. 51B) and the Gas Safety (Installation and Use) Regulations (Cap. 51C).

The RGSC will also check and ensure that the gas installations connected to their gas supply network are safe and sound for operation in a safe manner so that members of the public are not exposed to undue risks. The RGSC should ensure that the RGC has satisfactorily completed the soundness test and purging prior to commissioning of the gas installations.

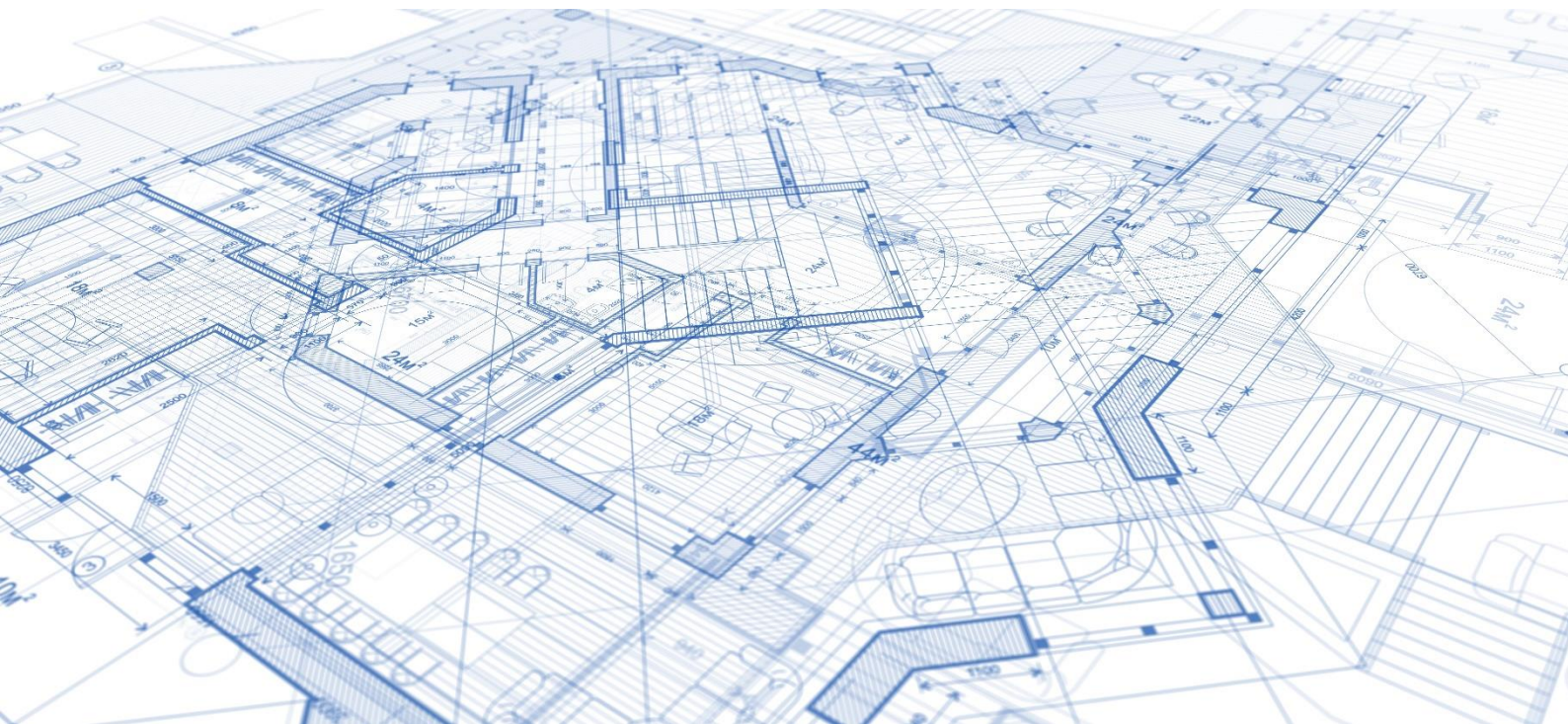
The AP/Consultant/RGC should liaise directly with the relevant RGSC to arrange for the gas main supply to the new buildings/developments in compliance with Gas Safety (Gas Supply) Regulations (Cap. 51B) and the Guidance Note on Gas Supply Installations.

²³ https://www.emsd.gov.hk/filemanager/en/content_286/gu01_cop_2009-revA.pdf

²⁴ https://www.emsd.gov.hk/filemanager/en/content_286/gu03.pdf

7

Transport Department



7. TRANSPORT DEPARTMENT

7.1 Project Planning Stage/Design Stage

In MiC projects, modules are delivered to site for assembly and installation. Before a decision can be made on the use of MiC for a project, a feasibility study should be carried out at the early project planning stage/design stage to assess and establish whether there is any route for transporting the modules from the MiC factory to the project site, taking into account ports and marine unloading points for marine transport, road conditions and constraints for road transport, and the need for traffic impact assessments at different stages of the project, etc.

‘Just-in-time delivery’ of the modules to the project site is the best approach. However, if this is not feasible, the feasibility study should include identification of temporary parking space and/or storage locations for the modules. Early advice from experienced logistics companies and trailer drivers on the logistics of delivery should be sought.

During the project planning stage/design stage, assessment of the traffic impact on the proposed delivery routes should be carried out in consultation with the relevant Traffic Engineering (TE) Division/Regional Office of TD and the Road Management Office (RMO)/Hong Kong Police Force (HKPF). Contacts of the TE Divisions and RMOs are given in Tables 7.1 and 7.2 respectively.

The width of traffic lanes in Hong Kong is typically 3.3 m, but may be less than 3 m at some local road sections. Vehicles delivering a load of a width not exceeding 3 m may generally be accommodated within a single traffic lane. In contrast, vehicles delivering a load of a width exceeding 3 m may encroach upon the adjacent or opposite traffic lane, which will impose significant traffic impact and road safety concern.

To facilitate consideration by TD/HKPF, the following supporting information will usually be required to be submitted, in particular for the case of a load width exceeding 3 m:

- (a) Swept path analysis to demonstrate the maneuverability of the vehicles at critical road sections such as narrow road segments, sharp bends, junctions, vehicular ingress and egress to destination/site, etc. (using AutoTrack, AutoTurn, AutoPath, etc.);
- (b) Traffic Impact Assessment (TIA) or traffic review to demonstrate the practicability of the delivery proposal, particularly on the time of delivery and its impact on road and junction capacities (Note: Reference can be made to Guidance Notes No. RD/GN/021A (Feb 2020) - Guidelines on Traffic Impact Assessment & Day-time Ban Requirements for Road Works on Traffic Sensitive Routes published by HyD (2020));

- (c) Temporary Traffic Management (TTM) schemes (or traffic improvement schemes) for the module transportation, if any, to illustrate the escort and road/ lane closure arrangement, temporary loading bay, and contingency parking place, etc. (Note: See HyD's Guidance Notes No. RD/GN/021A (Feb 2020), in particular Annex 2 of Appendix 1, for advice on the conditions under which TTM is required); and
- (d) Contingency plan to handle emergency situations, including the rescue arrangement for breakdown of transportation vehicle, evacuation proposal when the delivery route is being blocked by other vehicles, and procedures for reporting incidents to relevant personnel, etc.

In-principle approval of the proposed routes, and the conditions to be imposed on the use of the routes/vehicles, should be obtained. The approved routes and conditions should be included in the conditions of tender for reference by tenderers during the tendering process. This will give confirmation to the tenderers on the feasibility of adoption of MiC in the project, reduce risks and uncertainties to the project, and save cost and time.

7.2 Wide Load Permit

According to Regulation 55 of the Road Traffic (Traffic Control) Regulations (Cap. 374G), no driver shall drive on a road a vehicle that is so loaded that the load (a) in the case of a vehicle other than a trailer, extends forwards more than 1.5 m from the foremost part of the vehicle; (b) extends backwards more than 1.4 m behind the rearmost part of the vehicle; (c) extends sideways so that the total width of the load is in excess of 2.5 m; or (d) rises to such a height in excess of 4.6 m or to such lesser height as may cause damage to any object or wires lawfully erected above the road.

Road users must apply for a Wide Load Permit (WLP) from the TD's Licensing Office for delivering a load of width exceeding 2.5 m by vehicle. A vehicle may be driven loaded within the limits prescribed in the WLP issued under Regulation 54 of the Road Traffic (Registration and Licensing of Vehicles) Regulations (Cap. 374E).

Details of WLP application can be found in the Guidelines on Application for Wide Load Permit²⁵ published by TD.

The loading and transportation of MiC modules should comply with the Code of Practice for the Loading of Vehicles²⁶ published by TD.

²⁵

<https://www.td.gov.hk/filemanager/en/publication/guidelines%20on%20application%20for%20wide%20load%20permit.pdf>

²⁶ https://www.td.gov.hk/filemanager/en/publication/cop_loading_of_vehicles_eng.pdf

7.3 Procedures for Submitting a Wide Load Permit Application

An application form TD 290²⁷ should be duly completed and submitted to TD's Licensing Offices for the WLP application. The information and documents required for the application include the following:

(a) Particulars of Applicant

- (i) name of the registered owner of the vehicle under WLP application;
- (ii) identity document/Certificate of Incorporation of the registered owner;
- (iii) residential/company and correspondence address with acceptable proof of address issued not more than three months from the date of application (for a full list of acceptable proof of address, reference should be made to https://www.td.gov.hk/en/public_services/licences_and_permits/proof_of_address/index.html); and
- (iv) contact phone number.

(b) Particulars of Vehicle

- (i) registration mark, class, make, overall width and length of vehicle, where the vehicle under application must be a medium goods vehicle or a heavy goods vehicle, whether or not articulated with a trailer, with a total length not less than 9.1 m;
- (ii) vehicle registration document of the vehicle under WLP application; and
- (iii) valid third party insurance certificate or cover note in respect of the vehicle in the name of the registered owner for the entire period of the permit being sought.

(c) Particulars of Operation

- (i) reason for application;
- (ii) projection of loads: front projection/ rear projection/ overall projection; beyond both sides/ total width of loads/total weight of loads/ total length of loads; and
- (iii) details of routes, including delivery period and time schedule.

Upon receipt of the duly completed application form and all the required documents, the TD's Licensing Office will consult the Traffic Branch Headquarters/HKPF on the application. The respective Traffic Engineering and Transport Operations Divisions/

²⁷ https://www.td.gov.hk/en/public_forms/td_forms/permit/index.html

Regional Office of TD will also be invited to provide comments on the application with specific route(s).

The TD's Licensing Office will inform the applicant of the application result in writing within 25 working days upon receipt of the duly completed application with all required documents.

7.4 Conditions of a Wide Load Permit

Some or all of the following conditions may be imposed in the WLP:

- (a) Trial runs may be required to substantiate the practicability of the delivery proposal.
- (b) The vehicle issued with the WLP should only be operated on the route specified in the permit, and used together with the specified trailers.
- (c) The permit should be displayed on the front windscreen of the vehicle near to the vehicle licence.
- (d) The load should be properly secured to the vehicle, and no portion of the load should touch the road.
- (e) A red flag of an area ($>1 \text{ m}^2$) should be displayed at the rear extremity of the load.
- (f) During the hours of darkness or in poor visibility conditions, a white light showing ahead at each side of the front extremity of the load, and a red light showing to the rear at the rear extremity of the load should be used.
- (g) In general, the approved operating hours are from 1000 hrs to 1600 hrs and 2000 hrs to 0700 hrs. For WLP issued for application with specific route(s) and/or vehicle with coded permits, the approved operating hours are from 0100 hrs to 0600 hrs. The permit validity is 12 months or the validity period of the third party risk insurance in respect of the vehicle or the validity period of the vehicle licence of the vehicle, whichever is shorter.
- (h) Provision of escort vehicles to the front and rear of the load-carrying vehicle is required when the loads exceeds the width as stipulated in Regulation 55 of the Road Traffic (Traffic Control) Regulations. The condition imposed will depend on the road/route conditions and the justifications given in the application.
- (i) Permission should be obtained from the relevant management authority or owner of any areas or private roads prior to carrying the load through the areas or private roads, as the management authority or owner may restrict access of the vehicle, rendering the proposed route infeasible.
- (j) The overall height of the vehicle (i.e. including the height of the module) needs to be considered if the route passes through overhead bridges or structures. Beneath some bridges, gantries and other structures, where the clearance provided may be less than the maximum permitted vehicle height of 4.6 m, regulatory and/or warning traffic signs are erected to inform drivers of the restriction/prohibition.

Drivers transporting high loads should pay particular attention to such signs while driving on the road.

- (k) Prior routing approval for the project must be sought from the respective RMO/HKPF, TD and HyD to ensure that the deliveries will not cause any undue inconvenience to other road users nor damage to road pavements and underground utilities.

7.5 Module Delivery Stage

Depending on the routes taken, the degree of severity of impacts on the traffic and the transport and traffic management measures required, it may be necessary to set up a Traffic Management Liaison Group (TMLG) with representatives from TD, RMO/HKPF and HyD during the module delivery stage to consider and fine-tune the TTM measures.

7.6 Q&As on Transport of MiC Modules Including WLP Application

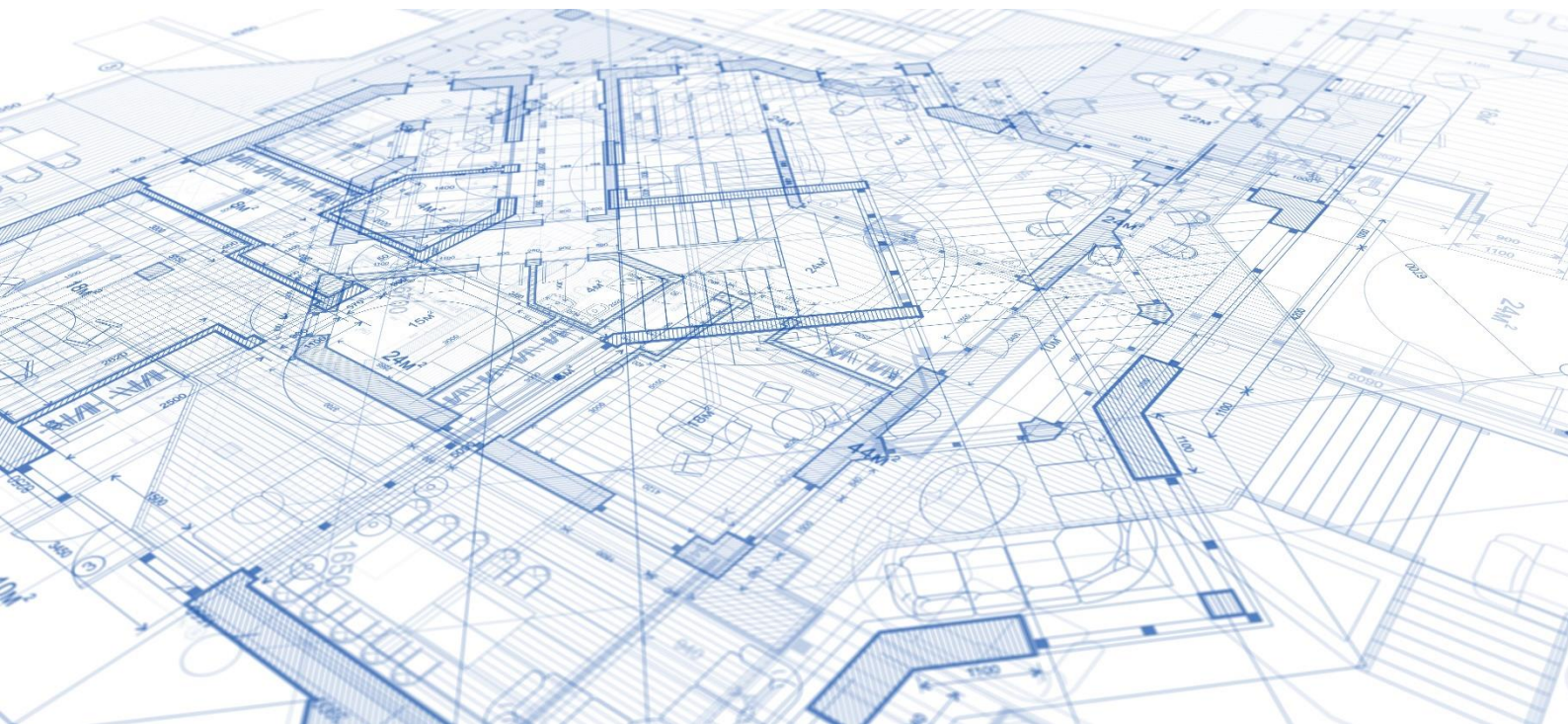
Q&As on the transport of MiC modules including WLP application are given in Appendix F1. Advisory Notes on TIA for MiC projects are given in Appendix F2.

Traffic Engineering Division	Address	Telephone	Fax Number
Traffic Engineering (HK) Division Urban Regional Office	37/F, Immigration Tower, 7 Gloucester Road, Wan Chai, Hong Kong	28295815	28240399
Traffic Engineering (Kowloon) Division Urban Regional Office	8/F, Mongkok Government Offices, 30 Luen Wan Street, Mongkok, Kowloon	23992471	23978046
Traffic Engineering (NTE) Division NT Regional Office	9/F, Mongkok Government Offices, 30 Luen Wan Street, Mongkok, Kowloon	23992194	23813799
Traffic Engineering (NTW) Division NT Regional Office	7/F, Mongkok Government Offices, 30 Luen Wan Street, Mongkok, Kowloon	23992194	23813799

Road Management Office	Address	Telephone	Fax Number
Road Management Office (HK Island) Enforcement & Control Division, Traffic HK Island, HK Island Regional HQs	Room 304, 3/F., Happy Valley Police Station, Hong Kong	28355278	28034783
Road Management Office (Kowloon West) Enforcement & Control Division, Traffic Kowloon West, Kowloon West Regional HQs	Room 208, 2/F., Traffic Kowloon West Operational Base, 8 Wai Wan Lane, Hung Hom, Kowloon	27735240	23997659
Road Management Office (Kowloon East) Enforcement & Control Division, Traffic Kowloon East, Kowloon East Regional HQs	1/F., Kowloon East Operational Base, 2 Siu Yip Street, Kowloon Bay, Kowloon	27553515	27504456
Road Management Office (New Territories South) Enforcement & Control Division, Traffic New Territories South, New Territories South Regional HQs	Room 1, G/F., E&C Block, New Territories South Operational Base, 4 Castle Peak Road, Tsuen Wan, New Territories	26113388	24151636
Road Management Office (New Territories North) Enforcement & Control Division, Traffic New Territories North, New Territories North Regional HQs	G/F., Tai Hing Operational Base, 80 Tsun Wen Road, Tuen Mun, New Territories.	24677793	24634236
Traffic Management and Prosecutions Bureau, Traffic Branch HQs	32/F, Arsenal House, Police Headquarters, No.1, Arsenal Street, Wan Chai, Hong Kong	28606263	22004377

8

Environmental Protection Department



8. ENVIRONMENTAL PROTECTION DEPARTMENT

8.1 Project Planning Stage/Design Stage

A MiC project generally faces two environmental regulatory constraints: traffic and noise. While there is less traffic constraint when modules are delivered during night time, the MiC works face the constraint of noise when they are carried out within the restricted hours²⁸.

It is a usual practice that the modules, upon arrival on site, are unloaded, hoisted and installed in position, after appropriate quality checks of the modules have been carried out. There is no restriction on the MiC works carried out between 7 am and 7 pm on a non-holiday from Monday to Saturday (i.e. normal weekdays). However, when the MiC works are carried out at any other time (i.e. the restricted hours), a valid Construction Noise Permit (CNP) issued by the Noise Control Authority (the Authority) of EPD in accordance with the Noise Control Ordinance (NCO) (Cap. 400) is needed. Therefore, carrying out of construction work including transportation of MiC modules during daytime in normal weekdays should be accorded priority as far as practicable.

An assessment of the noise impacts of the MiC works at the project site should be carried out in advance and the relevant Regional Offices of EPD may be consulted as necessary. The aims of the assessment are to establish the feasibility of carrying out the MiC works within the restricted hours, and to identify the potential noise issues that the project may face. The results of the assessment should be reviewed together with the traffic restrictions imposed by TD/HKPF to check if it is unavoidable to carry out the MiC works within the restricted hours. If it is genuinely unavoidable, then recommendations should be made on the appropriate noise mitigation measures, such as use of the quietest practical construction equipment and methods, to eliminate or minimize the impacts.

In-principle approval of the assessment, the mitigation measures proposed and the conditions to be imposed on the MiC works carried out within the restricted hours should be obtained before the tendering. The information obtained from the assessment is useful for the planning and programming of the MiC works, and should be included in the conditions of tender for reference by the tenderers during the tendering process.

²⁸ Restricted hours are 7 pm to 7 am or at any time on a general holiday (including Sunday) under the Noise Control Ordinance (NCO) (Cap. 400).

8.2 The CNP System

A CNP is required from EPD for carrying out the following work during evening and night time (1900 hour to 0700 hour) and any time on public holidays, including Sundays:

- (a) Prescribed Construction Work within Designated Areas, including (i) erection or dismantling of formwork or scaffolding; (ii) loading, unloading or handling of rubble, wooden boards, steel bars, wood or scaffolding material; and (iii) hammering; and
- (b) General construction work using any powered mechanical equipment (PME).

Designated Areas under the NCO are densely-populated built-up areas and their locations can be found at the EPD website from this link: https://www.epd.gov.hk/epd/english/environmentinhk/noise/help_corner/da.html

Reference can be made to the following details in making a CNP application:

- (a) How to complete and submit CNP application forms²⁹;
- (b) Requirements and procedure for application of Environmental Permits/Licences under the NCO³⁰; and
- (c) Guidelines on Application of CNP for using MiC Method³¹.

The CNP application should be made to the Regional Offices of EPD. Contacts of the Regional Offices are given in Table 8.1. The information and documents required for the CNP application include:

- (a) Application Form (Form 1 [EPD 74A(S)]³²) (application can be made using paper form or online: <https://epic.epd.gov.hk/eForm/ChangeLanguage.do?language=eng&url=/pages/datadownload/downloadMain.jsp>);
- (b) site plan (s) of appropriate scale (preferably 1:1000) showing the construction site and the nearby Noise Sensitive Receivers (NSRs) (Item B of Form 1);
- (c) site plan showing the locations of the Prescribed Construction Work (if appropriate);
- (d) photographs (two 3R size colour photographs) for each item of PME to be used (with the distance of the fixed PME items to be used from the site boundary or grid lines indicated in metres on the site plan (s));

²⁹ https://www.epd.gov.hk/epd/english/application_for_licences/guidance/cnp.html

³⁰ https://www.epd.gov.hk/epd/english/application_for_licences/guidance/application_maincontent36.html

³¹ https://www.epd.gov.hk/epd/sites/default/files/epd/g_cnp_mic_e.pdf

³² https://www.epd.gov.hk/epd/sites/default/files/epd/english/application_for_licences/applic_froms/files/epd74ae.pdf

- (e) photocopy of the Noise Emission Label for each and every proposed air compressor and hand-held percussive breaker, if appropriate;
- (f) photocopy of the Business Registration Certificate (BRC) if the applicant is a company or HKID if the applicant is an individual;
- (g) Noise Management Plan giving details of the quietest practical working method and equipment and other practical noise mitigation measures as detailed in the noise assessment carried out at the project planning stage/design stage; and
- (h) documentary proof from the relevant Authorities (i.e. TD/HKPF) to indicate that there are genuine traffic restrictions on transporting large/wide modules outside the restricted hours.

8.3 Assessment of Noise

The CNP will be processed and assessed in accordance with the Technical Memorandum (TM) on Noise from Construction Work other than Percussive Piling³³, and also the TM on Noise from Construction Work in Designated Areas³⁴ issued by EPD. Reference should also be made to the web links to the TM³⁵.

Generally, the process of assessing noise from the construction works is to:

- (a) identify the most affected Noise Sensitive Receivers (NSRs);
- (b) determine the Area Sensitivity Rating (ASR) for the area within which the NSRs are located, and hence determine the relevant Acceptable Noise Level (ANL);
- (c) calculate the Corrected Noise Level (CNL) which will be generated by the construction work at the NSRs; and
- (d) compare the CNL with the ANL.

If the CNL is equal to or less than the ANL, the CNP may be issued by the Authority in the prescribed form and may include such conditions as the Authority considers appropriate, such as some conditions mentioned in paragraph 8.4. If the CNL exceeds the ANL, a CNP will not generally be issued. Nonetheless, if the CNP applicant considers that it is unavoidable to carry out their works within restricted hours, documentary proof from the relevant Authorities (i.e. TD/HKPF) shall be submitted with the application for consideration whether there exists unavoidable constraints on working hours according to the TM, together with details of all quietest practical working methods, quieter PME (e.g. PME with Quality PME Label) and other practicable noise mitigation measures to be employed on site. If a CNP is

³³ https://www.epd.gov.hk/epd/sites/default/files/epd/english/envir_standards/files/GN2014P107-2014c-e.pdf

³⁴ https://www.epd.gov.hk/epd/sites/default/files/epd/english/envir_standards/files/GN2014P110-2014c-e.pdf

³⁵ https://www.epd.gov.hk/epd/english/environmentinhk/noise/guide_ref/tm_nonpp.html and
https://www.epd.gov.hk/epd/english/environmentinhk/noise/guide_ref/tm_des_area.html

issued under such circumstances, all these proposed measures will be imposed as conditions in the CNP.

In general, a CNP application can be processed within 18 days if all criteria in the relevant EPD checklist(s) can be met. No appeal can be made in relation to the issue of a CNP for the purpose of carrying out construction work during the restricted hours.

8.4 Conditions to be Imposed in a CNP

Some or all of the following conditions may be imposed in the CNP:

- (a) the initial period of such duration as the Authority considers appropriate;
- (b) the renewal period before or after the date of expiry for such further period or periods and subject to such alterations or new conditions as the Authority considers appropriate;
- (c) the permissible items of PME which may be used on the construction site;
- (d) the hours during which the CNP is valid;
- (e) the dates of commencement and expiry of the CNP;
- (f) any noise levels which may not be exceeded at specified locations during specified times, and any special noise control measures that must be adopted;
- (g) any noise mitigation measures mentioned in the Noise Management Plan submitted;
- (h) the time limit for the specific construction activities concerned (e.g. transportation and unloading of the MiC modules within the site); and
- (i) the requirement to notify the Authority soon upon the commencement of construction, indicating the construction involved and the noise mitigation measures taken for carrying out the works during the restricted hours.

8.5 Module Delivery and Installation Stage

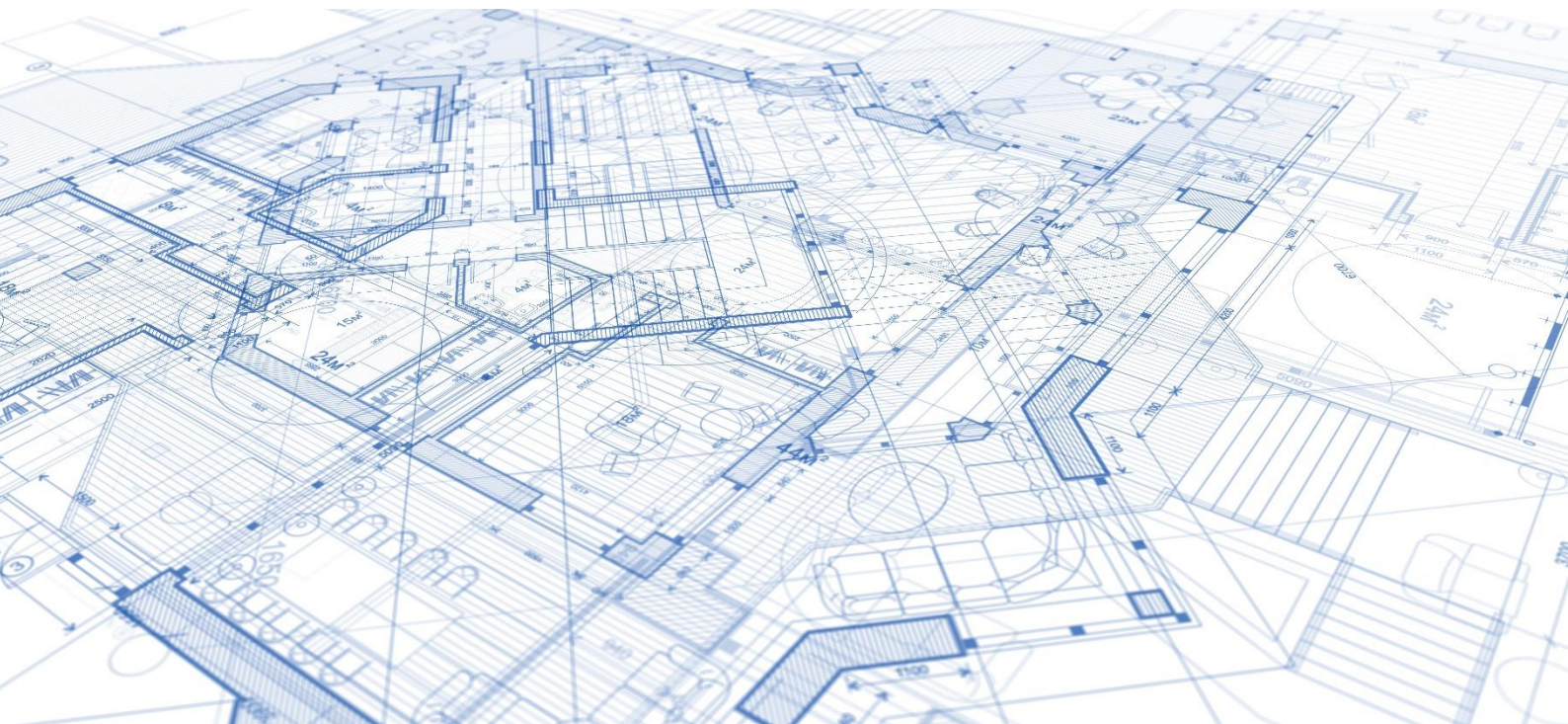
Prior to commencement of the MiC works, the contractor should inform (e.g. via issuing a notice and/or give a briefing) the estate management/owners' corporation of the nearby NSRs on the programme of the works, the advantages of MiC, and the need for carrying out the MiC works within the restricted hours. A hotline/enquiry number for effective communication should be provided.

Office/ Regional Offices	Address	Telephone	Fax Number	Email Address	Control Districts
Regional Office (East)	5/F, Nan Fung Commercial Centre, 19 Lam Lok Street, Kowloon Bay, Kowloon.	2755 5518	2756 8588	hotline_e@epd.gov.hk	Kwun Tong, Wong Tai Sin, Sai Kung, & Kowloon City
	8/F., Cheung Sha Wan Government Offices, 303 Cheung Sha Wan Road, Kowloon.	2402 5200	2402 8272	hotline_e@epd.gov.hk	Yau Tsim Mong
Regional Office (South)	2/F, Chinachem Exchange Square, 1 Hoi Wan Street, Quarry Bay, Hong Kong.	2516 1718	2960 1760	hotline_s@epd.gov.hk	Hong Kong Island & Islands
Regional Office (West)	8/F, Tsuen Wan Government Offices, 38 Sai Lau Kok Road, Tsuen Wan, New Territories.	2417 6116	2411 3073	hotline_w@epd.gov.hk	Tuen Mun, Tsuen Wan, Kwai Tsing & Sham Shui Po
Regional Office (North)	10/F, Sha Tin Government Offices, 1 Sheung Wo Che Road, Sha Tin, New Territories.	2158 5757	2685 1133	hotline_n@epd.gov.hk	Yuen Long, Sha Tin, Tai Po & North

³⁶ https://www.epd.gov.hk/epd/english/application_for_licences/sub_applic/application_maincontent38.html

9

Customs and Excise Department



9. CUSTOMS AND EXCISE DEPARTMENT

9.1 Import and Export Declaration

According to the Import and Export Ordinance (Cap. 60), the person in charge of a vehicle/vessel, on entering or leaving Hong Kong, should furnish the following for custom clearance: (i) a manifest in respect of the cargo on board, (ii) an import/export licence or a removal permit (if required), and/or (iii) other supporting documents such as a bill of lading, airway bill, invoice, packing list, etc.

In addition, all persons importing or exporting any articles, other than exempted articles, are required to lodge accurate and complete import/export declarations within 14 days after the importation/exportation of the article. With effect from 1 August 2018, the charge for each import and export declaration is capped at \$200. The cap will apply to goods imported, exported or re-exported to and from Hong Kong³⁷. Information on the cargo clearance requirements and import and export declaration can be found at the C&ED website from these links: http://www.customs.gov.hk/en/cargo_clearance/index.html and http://www.customs.gov.hk/en/cargo_clearance/declaration/index.html. Details of the articles which are exempted from the import and export declaration requirements can be found from this link: https://www.elegislation.gov.hk/hk/cap60E?xpid=ID_1438403523489_003.

9.2 Cargo Examination

Details of customs clearance of cargo conveyed by goods vehicles/vessels³⁸ are described below:

- (a) Land. There are six land boundary control points (LBCPs) for cross-boundary goods vehicles in operation³⁹: Man Kam To (7 am to 10 pm), Sha Tau Kok (7 am to 10 pm), Lok Ma Chau (24 hours), Shenzhen Bay (6:30 am to 12 mid-night), Hong Kong-Zhuhai Macao Bridge Hong Kong Port (24 hours) and Heung Yuen Wai (7 am to 10 pm), as shown in Figure 9.1. There is generally no restriction in the size of modules processed at the LBCPs. The Heung Yuen Wai LBCP became operational on 26.8.2020. This new LBCP has enabled a more balanced distribution of cross-boundary connection with the Mainland network, as shown in Figure 9.2.

³⁷ https://www.customs.gov.hk/en/cargo_clearance/declaration/charges/index.html

³⁸ https://www.customs.gov.hk/en/cargo_clearance/clearance/examination/index.html

³⁹ https://www.customs.gov.hk/en/contact_us/passenger_clearance/index.html

Drivers entering Hong Kong are subjected to duty charge for dutiable goods⁴⁰. In addition, drivers should comply with any requirement, direction or demand given or made by a member of C&ED, or instruction conveyed by a visual display unit installed at a customs clearance point. Otherwise, they may be prosecuted.

For cargo imported or exported by trucks through the LBCPs, registered shippers or their authorised agents can make use of the Road Cargo System (ROCARS⁴¹) to submit advance cargo information to C&ED by electronic means. Cross-boundary truck drivers can enjoy seamless customs clearance service when they convey road cargoes across LBCPs. They will be signalled by ROCARS whether their vehicles should be examined upon arrival at the fully automated customs clearance facilities at the LBCPs.

C&ED adopts a risk management approach to identify and select cargoes/vehicles/drivers/passengers for inspection at the LBCPs. Different inspection methods/equipment, including physical checks, vehicle searches, use of detector dogs, Mobile X-ray Vehicle Scanning Systems and Vehicle X-ray Inspection Systems, etc., are used in the inspection process as and when necessary.

The size of the cargo loaded on board a vehicle, among other information, is also governed by the requirements set by TD given in Section 7.

Notwithstanding the above, it is necessary to check the customs clearance procedures outside Hong Kong to ensure smooth delivery. The contact numbers of the respective LBCPs can be found at the C&ED website from this link: https://www.customs.gov.hk/en/contact_us/cargo_clearance/index.html.

- (b) Sea. The places that handle sea cargoes are the Kwai Tsing Container Terminals, Public Cargo Working Areas, River Trade Terminal and Mid-stream Sites, and their locations are included in Figure 9.1.

For containerized cargoes conveyed by ocean-going vessels, C&ED will issue detention notices to the shipping agents, container terminal operators, godown operators and consignees requiring their submission of cargo manifests for customs scrutiny. Carriers can submit the cargo manifests in paper form or via the Electronic System for Cargo Manifests (EMAN)⁴² prior to the arrival of shipments.

⁴⁰ Under the Dutiable Commodities Ordinance, dutiable goods include liquors, tobacco, hydrocarbon oil and methyl alcohol.

⁴¹ https://www.rocars.gov.hk/en/landing_page.html

⁴² [https://www.cedb.gov.hk/citb/doc/en/gets/EMAN_Guidebook_\(Eng\).pdf](https://www.cedb.gov.hk/citb/doc/en/gets/EMAN_Guidebook_(Eng).pdf)

For containerized cargoes conveyed by river trade vessels, C&ED will issue detention notices to the consignees of the cargoes, shipping agents, container terminal operators and godown operators requiring their cargoes to be removed to premises nominated by the consignees, owners or shipping agents for cargo examination.

For non-containerized sea cargoes, C&ED will deploy officers to conduct strike and search operations onboard the vessels or at the respective loading spots, e.g. Public Cargo Working Areas or buoys. The masters or agents of the vessels are required to furnish manifests in respect of the cargoes being imported or exported if they are requested to do so.

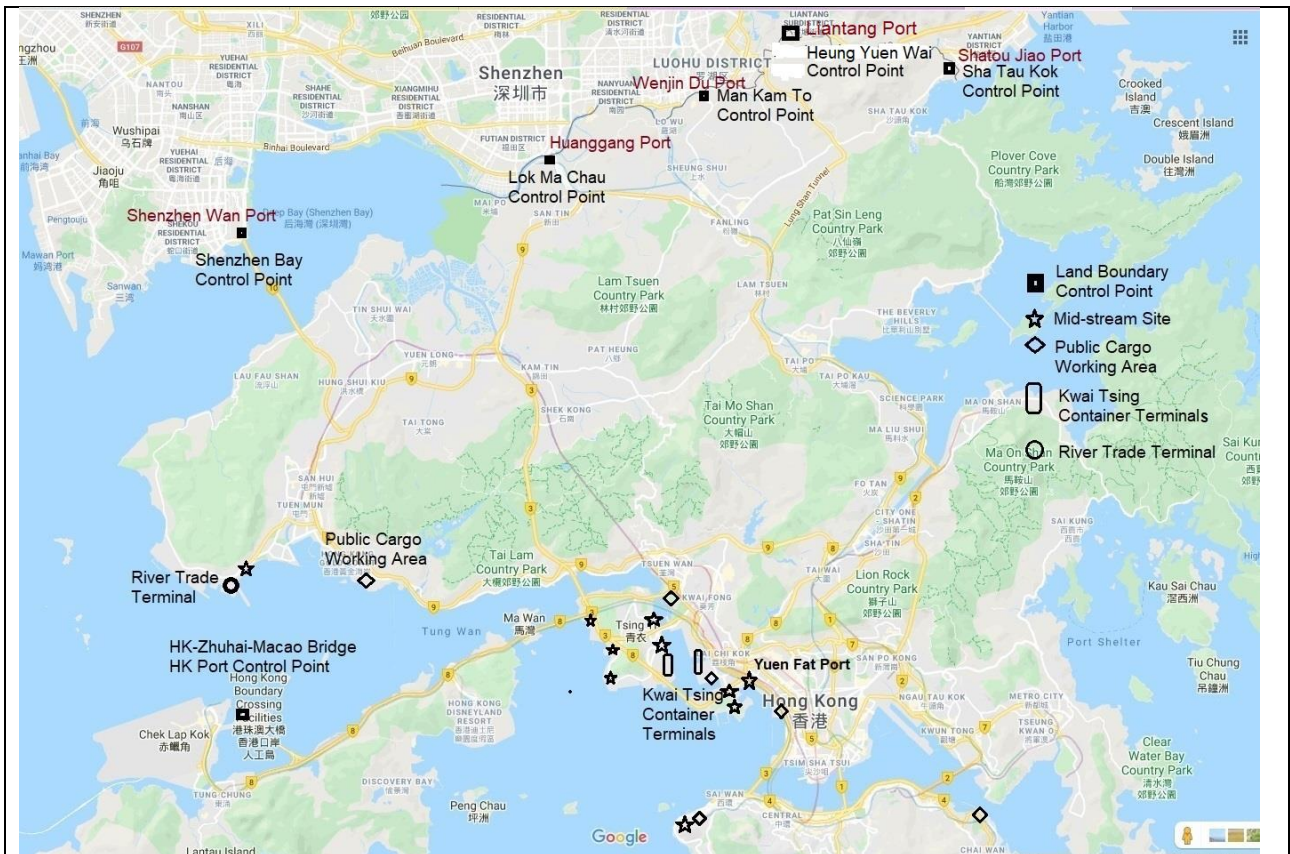


Figure 9.1 – Locations of Land Boundary Control Points, Kwai Tsing Container/River Trade Terminals, Mid-stream Sites and Public Cargo Working Areas (<https://www.hkmpb.gov.hk/en/port.html>)



Figure 9.2 – Location of the New Land Boundary Control Point at Liantang/ Heung Yuen Wai (https://www.pland.gov.hk/pland_en/p_study/comp_s/LTHYW/en/e_main.htm)

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WSD (2019). Form WWO 1149 - List of Pipes and Fittings Intended to be Installed (<https://www.wsd.gov.hk/filemanager/en/share/pdf/wwo1149e.pdf>).

APPENDIX A - LIST OF CONTACT POINTS OF RESPECTIVE GOVERNMENT DEPARTMENTS IN RELATION TO THIS REFERENCE MATERIAL

Chapter	Department	Post	Division/Section	Telephone
3	Buildings Department	TS/Building BS/TS3	Corporate Services Division Technical Services Section Technical Services Unit (Building)	38423453 38423447
4	Fire Services Department	Assistant Divisional Officer (Policy)3	Policy Division Licensing and Certification Command	27331543
5	Water Supplies Department	E/Technical Support 4	Supply and Distribution (NT) Branch Technical Support Division Technical Support Unit	28295657
6	Electrical and Mechanical Services Department	EME/Consumer Installations 1/1	Electricity and Energy Efficiency Branch Electricity Legislation Division Consumer Installations Sub-division 1	28083833
		EME/Electrical Products/4	Electricity and Energy Efficiency Branch Electricity Legislation Division Electrical Products Sub-division	28083109
		E/Gas Standards A3/1	Gas and General Legislation Branch Gas Standards Division A Gas Standards A3 Sub-division	28083657
7	Transport Department	SE/Road Safety 2	Technical Services Branch Road Safety and Standards Division Road Safety 2 Section	38426090
		EO/Licensing (HK)	Licensing Unit Hong Kong Licensing Office VALID and Licensing Division Licensing Section	28042630
8	Environmental Protection Department		General Enquiry (enquiry@epd.gov.hk)	28383111
9	Customs & Excise Department		General Enquiry (customsenquiry@customs.gov.hk)	28157711

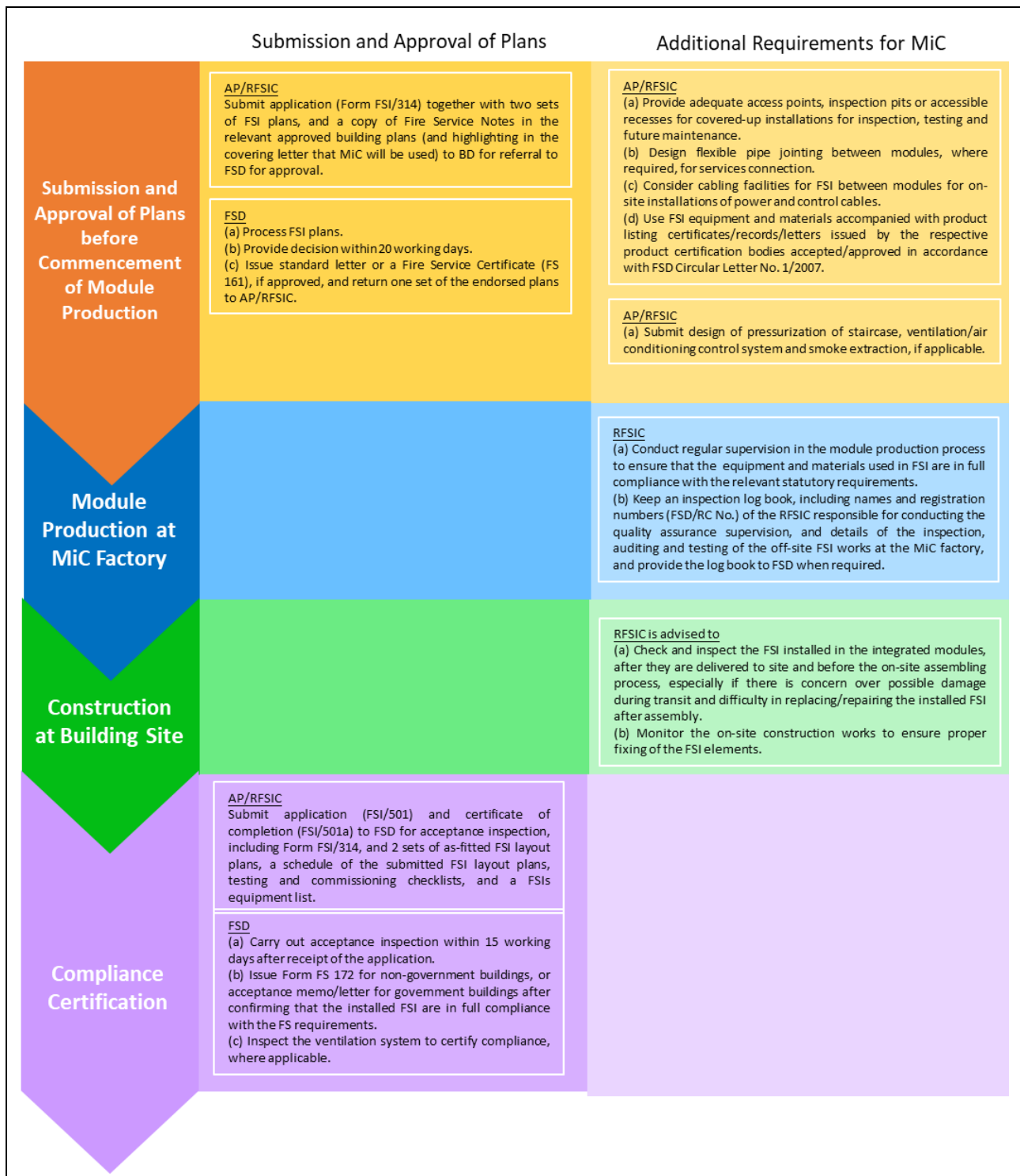
APPENDIX B - WORKFLOW FOR SUBMISSION AND APPROVAL OF PLANS TO BUILDINGS DEPARTMENT AND ADDITIONAL REQUIREMENTS FOR MIC

Project Stage	Submission and Approval of Plans	Additional Requirements for MiC
Submission and Approval of Plans before Commencement of Module Production	<p><u>AP/RSE</u> Submit GBP, superstructure plans, etc., to BD for approval.</p> <p><u>BD</u> (a) Process GBP, superstructure plans, etc. (b) Provide decision within 60 days.</p>	<p><u>AP/RSE</u> Prepare submissions in compliance with the requirements under the BO and its subsidiary regulations with reference to the relevant in-principle acceptance granted by BD if applicable.</p> <p><u>AP/RSE/RGBC</u> (a) Submit Quality Assurance Scheme and MIC Supervision Plan in accordance with the imposed approval conditions at least 14 days before commencement of the production work in the MIC factory. (b) Notify BD in writing if opting for alternative on-site audit check.</p>
Module Production at MiC Factory		<p><u>AP/RSE/Quality Control Supervisory Team</u> (a) Conduct regular supervision (AP and RSE-monthly and T3*-weekly). (b) Supervise module production in respect of fire resisting construction, drainage works, structures, etc. (c) Keep records of production, inspection, auditing and testing of modules (T3*) in a log book, with a copy kept at building site office for BD inspection when required.</p> <p><u>Authorized Signatory of RGBC / Quality Control Co-ordination Team</u> (a) Conduct regular supervision (AS-monthly, T3*-weekly and T1*-continuous). (b) Supervise module production. (c) Keep records of production, inspection, auditing and testing of modules (T3*/T1*) in a log book, with a copy kept at building site office for BD inspection when required.</p>
Construction at Building Site	<p><u>AP/RSE</u> Apply for consent to commence superstructure works.</p> <p><u>BD</u> (a) Process consent application. (b) Provide decision within 28 days.</p>	<p><u>AP/RSE/RGBC</u> (a) Notify BD not less than 7 days before commencement of site works. (b) Supervise site installation works. (c) Submit a copy of the AP, RSE and RGBC's audit reports on the MiC factory. (d) Submit structural material certificates/test reports in accordance with the imposed approval conditions.</p> <p><u>AP/RSE</u> If opting for alternative on-site audit check: (a) Submit on-site audit report on the quality of the MiC elements delivered to the building site. (b) Submit HOKLAS-endorsed certificates for concrete/tensile strength testing within 60 days of the delivery of the modular units.</p>
Completion Certification	<p><u>AP/RSE/RGBC</u> (a) Certify completion of building works in accordance with the BO and its subsidiary regulations and the approved plans. (b) Submit record plans and schedule of building materials and products in accordance with PNAP APP-13.</p> <p><u>BD</u> (a) Process occupation permit application. (b) Provide decision within 14 days.</p>	

* T3/T1 refers to Grade T3/T1 Technically Competent Person equivalent as stipulated in the Code of Practice for Site Supervision

Note: Reference should be made to PNAP ADV-36 - Modular Integrated Construction.

APPENDIX C - WORKFLOW FOR SUBMISSION AND APPROVAL OF PLANS TO FIRE SERVICES DEPARTMENT AND ADDITIONAL REQUIREMENTS FOR MiC



Note: Reference should be made to FSD Circular Letter No. 3/2019 - Guidance Notes on Submission, Approval and Acceptance Inspection of Fire Service Installations and Equipment in Modular Integrated Construction Building Projects and FSD Circular No. 1/2020 - Revised Application Procedure for Inspection and Testing of Fire Service Installations and Equipment in New Building.

APPENDIX D1 - WORKFLOW FOR SUBMISSION AND APPROVAL OF PLANS TO WATER SUPPLIES DEPARTMENT AND ADDITIONAL REQUIREMENTS FOR MIC

Project Stage	Submission and Approval of Plans	Additional Requirements for MiC
Submission and Approval of Plans before Commencement of Module Production	<p><u>Applicant/Consultant</u> Submit application (Form WWO 542) together with a plumbing proposal to WSD for approval.</p> <p><u>WSD</u> Issue approval letter for Form WWO 542 and demand note.</p> <p><u>AP, LP and Applicant</u> Submit Form WWO46 Parts I & II to WSD to seek permission for commencement of plumbing works at building site.</p>	<p><u>AP/Consultant</u> Submit the following: (i) a section clearly specifying the part of the plumbing installations to be constructed in the MiC factory; and a Vertical Plumbing Line Diagram and/or other documents as appropriate showing the extent of the plumbing installations; and (ii) a supervision plan of the construction of the plumbing installations at the MiC factory for agreement by WSD.</p> <p><u>AP/Consultant</u> Submit the following if there are parts of plumbing installations to be covered up in the MiC factory, in such a manner that they cannot be exposed for inspection and non-destructive tests at the building site: (i) shop drawings showing details of the plumbing installations in the modules that will be covered up in the MiC factory; and (ii) production schedule of the modules, in particular the production schedule of the plumbing works and the corresponding inspection schedule for the plumbing works to be covered up in the modules in the MiC factory.</p>
Module Production at MiC Factory	<p><u>WSD</u> Issue Form WWO46 Part III to grant permission for commencement of plumbing works at building site.</p>	<p><u>LP, RPW, MiC Supplier</u> (a) Implement the supervision plan as agreed by WSD. (b) Keep supervision records and produce to WSD for inspection when required. (c) Declare (by LP) on the supervision records any supervision carried out in the MiC factory. (d) Coordinate and liaise (by LP) with the WSD's Inspection Agent regarding the exact inspection dates of the plumbing installations to the covered up at the MiC factory.</p> <p><u>WSD's Inspection Agent</u> Carry out interim inspection of the concealed parts of the plumbing installations at the MiC factory before they are covered up, to ensure compliance with WWO/WWR.</p> <p><u>LP or His/Her Representative</u> Be present at all interim inspections carried out by the WSD's Inspection Agent.</p>
Construction at Building Site	<p><u>LP</u> Submit Form WWO 46 Part IV upon completion of whole plumbing works of the MiC project for final inspection.</p> <p><u>WSD</u> Carry out final inspection for completed plumbing works.</p>	
Compliance Certification	<p><u>WSD</u> Inform LP to provide water supply on site and issue Form WWO 46 Part V to LP and applicant.</p>	<p><u>WSD</u> Grant approval of the completed works (issuance of Form WWO 46 Part V(a)) subject to: (i) satisfactory results of the final inspection by WSD at the building site; (ii) satisfactory results of the interim inspections by the WSD's Inspection Agent of the concealed parts of the plumbing works before they are covered up in the MiC factory; and (iii) compliance with the commissioning requirements specified by WSD.</p>

Note: Reference should be made to Sections 3.12, 4.1.3, 4.2A, 4.3.2A and 4.3.3A and Appendices 2 and 26 of the WSD's Guide to Application for Water Supply (<https://www.wsd.gov.hk/en/plumbing-engineering/requirements-for-plumbing-installation/guide-to-application-for-water-supply/index.html>).

**APPENDIX D2 - RECORD FORM FOR SUPERVISION OF PLUMBING WORKS
CONSTRUCTED AT MiC FACTORY**

Project Name: _____
Address of MiC factory: _____
WSD Reference No. (CCID/ASN): _____
Period of supervision of construction at MiC factory: ____ / ____ / ____ to ____ / ____ / ____

A. Registered Plumbing Workers (RPW) Supervision Record:

Name of RPW	Registration no.	Date	Start Time	End Time

Signature(s) of RPW Date

B. Licensed Plumbers (LP) Supervision and Inspection Record:

Name of responsible LP: _____ LP No.: _____

Date	Start Time	End Time

I, _____, declare that plumbing works carried out in the MiC factory mentioned above during DD/MM/YY to DD/MM/YY have been supervised according to the supervision plan accepted by the Water Authority under the CCID/ASN No. mentioned above. The supervision and inspection are carried out at the date and time as detailed in this record form.

Signature of LP Date

APPENDIX E1 – INFORMATION NOTE ON ELECTRICITY SUPPLY APPLICATION

To apply for electricity supply, apart from complying with the statutory requirements of the Electricity Ordinance (Cap. 406), the AP/Consultant should submit directly to the electricity supplier relevant information about the proposed development, including a location plan of the project, proposed use of the project, floor plan, proposed transformer room (if required)/customer's switch room location, loading information, standard load estimation information, etc., as shown in the workflow in Appendix E2. The electricity suppliers in Hong Kong are CLP Power Hong Kong Limited and The Hongkong Electric Company Limited. The electricity supplier will determine the proposed supply and inform the AP/Consultant about the requirements and arrangement for providing electricity supply, including transformer room layout requirements (if a transformer room is required) /requirements for the customer's switch room. The REC/REW will then submit a duly-signed electrical schematic wiring diagram. The applicant will return the necessary undertaking letters or other documents to the electricity supplier, as described in the requirements for provision of supply.

The applicant should submit an application form for each electrical installation to the electricity supplier and pay the required service charge and deposit (if applicable). Upon completion of the construction, the AP/Consultant/REC/REW should hand over the necessary facilities, including a new transformer room if required, to the electricity supplier. The electricity supplier will then carry out site work to provide electricity supply to the new building.

APPENDIX E2 - WORKFLOW FOR SUBMISSION AND APPROVAL OF PLANS TO ELECTRICITY SUPPLIER AND ADDITIONAL REQUIREMENTS FOR MiC

Project Stage	Submission and Approval of Plans	Additional Requirements for MiC
Submission and Approval of Plans before Commencement of Module Production	<p><u>AP/Consultant</u> Submit details of proposed project with a location plan of the project, proposed use of the project, floor plan, proposed transformer room layout (if provided), loading information, standard load estimation information, etc., to the Electricity Supplier for determination of the proposed arrangement and requirements for providing supply to the new building.</p> <p><u>Electricity Supplier</u> Inform the AP/Consultant about the requirements for providing supply, including the transformer layout requirements if erection of a new transformer room is required, after determining the supply arrangement for the new building.</p> <p><u>REC/REW</u> Submit duly-signed electrical schematic wiring diagram.</p> <p><u>Applicant</u> Return the necessary undertaking letters or other document as described in the requirements of supply provision to the Electricity Supplier, if required.</p> <p><u>Applicant</u> Submit formal application form for each electrical installation to the Electricity Supplier and pay required service charge and deposit (if applicable).</p>	
Module Production at MiC Factory		<p><u>REC/REW</u> Carry out insulation resistance (megger) test and other tests as stipulated in the Code of Practice for the Electricity (Wiring) Regulations issued by EMSD on wiring works for pre-wired circuits off site. (Note: A Megger test is a method of testing using an insulation tester resistance meter to verify the condition of an electrical insulation.)</p>
Construction at Building Site	<p><u>AP/Consultant</u> Construct and hand-over the necessary facilities, including new transformer room if required, to the Electricity Supplier.</p> <p><u>Electricity Supplier</u> Carry out site work to provide electricity supply to the new building.</p>	
Compliance Certification	<p><u>REC/REW</u> After completion of the electrical installation, issue a Work Completion Certificate (Form WR1) and arrange installation inspection with the Electricity Supplier.</p> <p><u>Electricity Supplier</u> Install meters and connect the supply to the public supply installation and flats, after satisfactory installation inspection.</p>	

APPENDIX F1 - Q&AS ON TRANSPORT OF MiC MODULES INCLUDING WIDE LOAD PERMIT APPLICATION

Q1. Under what circumstances will a Wide Load Permit be needed?

A1. In accordance with Regulation 55 of the Road Traffic (Traffic Control) Regulations (Cap. 374G), no driver shall drive on a road a vehicle with its load extending sideways so that the total width of the load is in excess of 2.5 m unless the vehicle is issued with a Wide Load Permit (WLP) under the Road Traffic (Registration and Licensing of Vehicles) Regulations (Cap. 374 E). As such, obtaining a valid WLP is a statutory requirement for delivering a load of width exceeding 2.5 m. The typical submission requirements for a WLP application are stated in the “Guidelines on Application for Wide Load Permit” published by the Transport Department (TD)⁴³ in November 2019.

The WLP application can be made through the Licensing Office/TD, and for general enquiry on transportation of MiC modules, the client/traffic consultant may approach the Road Safety and Standards Division/TD. The client/traffic consultant may also liaise with the relevant Traffic Engineering (TE) Division/TD on the details and particular requirements for the supporting materials on the WLP application.

Q2. What is the procedure involved in the Wide Load Permit application for transport of MiC modules wider than 2.5 m?

A2. Road users will need to apply for a WLP when they drive a vehicle with a load wider than 2.5 m. The WLP can be applied through the Licensing Office of TD. There are two ways to deal with the transport of a MiC module wider than 2.5 m for MiC projects. The main difference is the time frame in conducting the traffic study for the project, as follows:

- (a) Traffic study at project planning stage/design stage. In this case, the client/consultant will need to engage a traffic consultant at the project planning/design stage to carry out a feasibility study to assess and establish whether there is any route for transporting the MiC modules from the MiC factory to the project site, taking into account ports and marine unloading points for marine transport, road conditions and constraints for road transport, time period and frequency, and the need for traffic impact assessments at different stages of the project, etc. The assessment of the traffic impact on the proposed delivery routes should be carried out in consultation with the relevant TE Division/TD and the Road Management Office (RMO)/ Hong Kong Police Force (HKPF).

In-principle approval of the proposed routes, and the conditions to be imposed on the use of the routes/ vehicles, will be given in not less than 3 months by TD. The approved routes and conditions, such as delivery logistics for the modules, constraints to be imposed on the module width, height and length, time period and frequency, etc., can be included in the conditions of tender for reference by tenderers during the tendering

43

<https://www.td.gov.hk/filemanager/en/publication/guidelines%20on%20application%20for%20wide%20load%20permit.pdf>

process. This will give confirmation to the tenderers on the feasibility of adoption of MiC in the project, reduce risks and uncertainties to the project, and save cost and time.

The contractor, after the contract has been awarded, should liaise with a logistics company to apply for the WLP for the vehicles involved in the delivery based on the proposed routes and conditions given in the in-principle approval. The Licensing Office of TD will inform the applicant of the application result in writing within 25 working days upon receipt of the duly completed application and all the required documents.

The above project arrangement, as shown in Annex A, is strongly recommended for MiC projects.

- (b) Traffic study at project construction stage. In this case, the contractor will need to engage a traffic consultant to assess the feasibility of transporting the modules to the project site only after the contract has been awarded. The traffic consultant should touch base/ make contact with the relevant TE Division of TD on the details/ types/ depth of analysis in the traffic study. It should be noted that this submission process will take not less than 3 months, in the same way given in A2(a) above. The submissions can be made to RMO for parallel assessment. After the queries in respect of the submissions have been resolved and the submissions have been agreed, the contractor should then engage a logistics company to apply for the WLP through the Licensing Office of TD. The Licensing Office of TD will inform the applicant of the application result in writing within 25 working days upon receipt of the duly completed application and all the required documents.

Q3. How many WLPs have been issued?

A3. The number of WLPs issued as of 30.4.2020 is given in Annex B.

Q4. The WLP application will be made through the Licensing Office of TD, together with the necessary reports and documents. Can the reports and documents be submitted to the relevant TE Divisions and RMO for parallel assessment?

A4. See A2(b) above. The traffic consultant responsible for the project is recommended to submit the assessment reports and documents to the relevant TE Divisions and RMO for parallel assessment. After the queries in respect of the submissions have been resolved and the submissions have been agreed, the contractor should then engage a logistics company to apply for the WLP through the Licensing Office.

Q5. What supporting information is needed to support the WLP application, in particular for the transport of MiC modules up to 3 m?

A5. The general requirements for delivery of wide load are given in the table in Annex C. According to the Guidelines on Application for WLP published by TD, supporting information including Swept Path Analysis (SPA), Traffic Impact Assessment (TIA), Temporary Traffic Management (TTM) scheme (or traffic improvement/diversion scheme) and Contingency Plan (CP) is needed for the transport of MiC modules up to 3 m, in particular.

Q6. In a TIA, what are the aspects which need to be considered and what are the acceptance criteria that TD adopts to accept the hours of delivery of MiC modules proposed in the TIA?

A6. Each TIA will be assessed on a case-by-case basis. The aspects that need to be considered in the TIA are: existing traffic conditions, forecast traffic conditions with module delivery, results of the analysis of traffic impacts due to delivery of modules, proposed TTM schemes (or traffic improvement/diversion schemes) to improve traffic flow, swept path analysis at critical locations, contingency plan for emergency/incidents, etc. TD will consider the assumptions made in the analysis, justifications provided, functionality/ practicality/ effectiveness of the proposed traffic improvement/diversion schemes to ameliorate the traffic impacts, etc., in deciding to accept or not the proposed hours of delivery of the modules. Details can be found in the Advisory Notes on TIA for MiC projects in Appendix F2.

Q7. Under what condition will a TTM scheme be needed? Will traffic police be needed in the operation of a TTM scheme? If so, under what condition would it be needed? What is the response time to a submission for a TTM scheme?

A7. A TTM scheme may be needed for narrow road segments, sharp bends, junctions, vehicular ingress and egress to destinations, etc., specific to the project, which should be highlighted in the TIA. Traffic police will only be needed on a case-by-case basis to assist and supervise the setup of a TTM scheme for operation. RMO will be able to provide comment on the submitted TTM scheme within 2 to 3 weeks depending on the complexity of the proposal.

Q8. The condition of police escort in the delivery of MiC modules may be imposed. Under what condition will this condition be imposed?

A8. Self-arranged escort is the practice recommended by the police. According to Condition No. 6 given in Form TD 290 (for WLP application), escort vehicles to the front and rear of the load-carrying vehicle are required. An escort vehicle shall be equipped with an amber flashing light in accordance with Regulation 111 of the Road Traffic (Construction and Maintenance of Vehicles) Regulations (Cap. 374A), and shall display in a prominent position, either at the front, rear or on the roof of the vehicle (but such that the flashing light is not obscured), with a sign conforming with diagram "A" or "B" shown in Form TD 290 as appropriate. On the leading escort vehicle, the sign shall be displayed to the front so as to face oncoming vehicles, and on the trailing escort vehicle, the sign shall be displayed to the rear to face the following vehicles. When mounted on the roof of an escort vehicle, signs may be double-sided.

There are however situations where police escort may be needed, for example, when the delivery crashes with a VIP convoy on the day, there is an accident along the route, etc. Under the above-mentioned special situations, there is no charge for the police escort provided. It is recommended that adequate securing, safety and delivery support measures are provided for delivery of MiC modules and implementation of the TTM schemes, if necessary.

Q9. Cross region deliveries are common in the delivery of MiC modules. A few TE Divisions/ Sections will be involved. Is there a one-stop shop service in TD for cross region deliveries? Who are the contact persons in TD in this case? Also, is there a one-stop

shop service in RMO for cross region boundaries? Who are the contact persons in this case?

A9. Contacts of the TE Divisions and RMOs are given in Tables 7.1 and 7.2 respectively in Chapter 7. The RMOs will co-ordinate among themselves when cross region deliveries are involved. When necessary, the Traffic Branch HQs/HKPF will provide the one-stop service for cross region deliveries. No one-stop shop service is provided by TD.

Q10. What are the details required for seeking approval for use of the Eastern Harbour Crossing (EHC)/Western Harbour Crossing (WHC) in transporting the modules wider than 2.5 m?

A10. According to Condition No. 9 given in Form TD 290 (for WLP application), the applicant is required to seek approval from the relevant authority prior to carrying the load in any area or private road of which the management authority or owner may restrict the access of the vehicle. The applicant is required to approach directly the authority of the EHC/WHC for approval of transporting the modules across the tunnel. The application requirements are: application letter, vehicle/ trailer registration details, WLP of the vehicle and 3rd party insurance of the vehicle/ trailer. The following steps are involved:

EHC

- (a) applicant to send the application together with the necessary papers to the operator of the EHC for approval, including the proposed date and time of crossing the tunnel (a confirmation letter will be issued by the operator of the EHC);
- (b) applicant to arrange the vehicle to arrive at the EHC Control Area at the time specified (MUST);
- (c) vehicle driver to pay the handling fee to the operator of the EHC by cash; and
- (d) vehicle driver to drive the vehicle under arrangement by the EHC Tunnel Control Team.

WHC

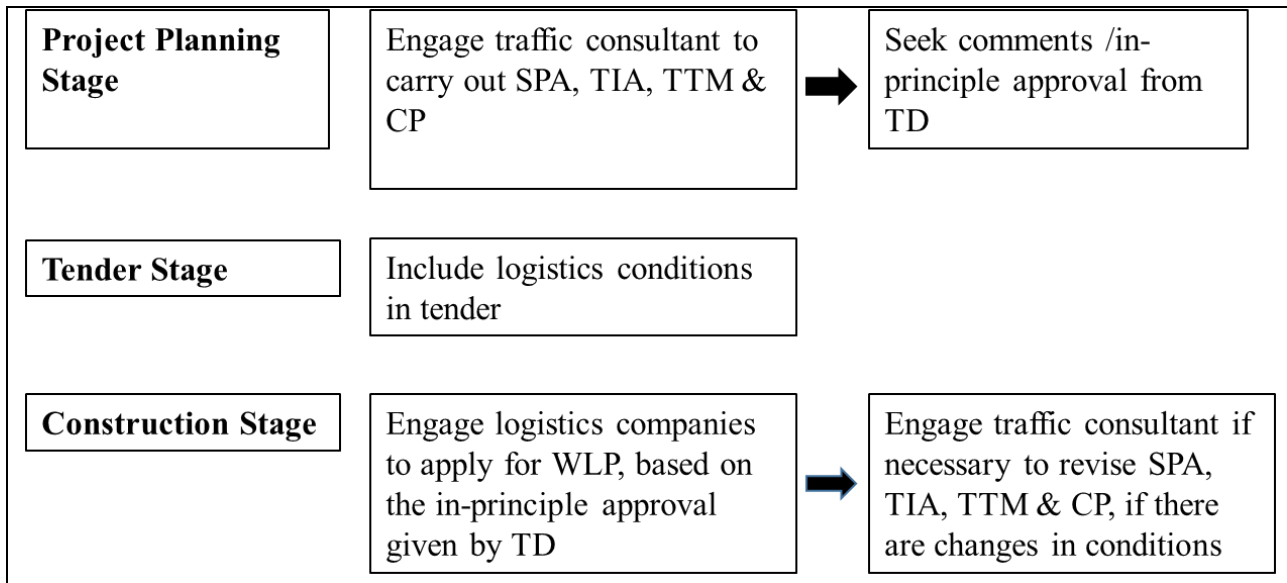
- (a) applicant to fax the application letter together with the necessary document to the operator of the WHC **at least 48 hours** before the proposed passage for approval, including the following details:
 - (i) proposed date, time and direction of crossing the tunnel;
 - (ii) company name, contact person, tel. no.;
 - (iii) nos. of vehicles/trailers, vehicle registration no./serial no.;
 - (iv) description of special vehicles/trailers and loads; and
 - (v) copies of vehicle/trailer registration document; motor vehicle licence; motor vehicle certificate of insurance; WLP; photo or sketch of the load.

- (b) the operator of the WHC to confirm the applicant by phone;
- (c) applicant to arrange the vehicle to arrive at the WHC Control Area at the time and location specified (MUST);
- (d) vehicle driver to pay the handling fee to the operator of the WHC by cash; and
- (e) vehicle driver to drive the vehicle under arrangement by the WHC Tunnel Control Team.

Contact details of the operators of the EHC/WHC are given in Annex D. Similar application procedures apply to other tunnels, and the contacts of their operators and be found in the TD's website⁴⁴.

⁴⁴ https://www.td.gov.hk/en/transport_in_hong_kong/tunnels_and_bridges/index.html and https://www.td.gov.hk/filemanager/en/content_164/contact%20tunnels%20control%20areas%20operators%20revised_23.9.pdf

Annex A – Suggested Project Arrangement for MiC Projects



Annex B – No. of WLPs Issued (as of 30.4.2020)

In Terms of	Type	No. of WLPs Issued in			No. of Valid WLPs (as of 30.4.2020)
		2018	2019	2020 (up to 30.4.2020)	
Type of Vehicle	Medium goods vehicle	438	525	188	431
	Heavy goods vehicle	234	250	73	228
Registered Owner	Individual		100	30	78
	Business		675	231	581

Annex C – General Requirements for Delivery of Wide Load in Hong Kong

	Routine	Case by Case	Case by Case
	Overall Width ≤2.5m	2.5m<Overall Width≤3m	Overall>3m
WLP Required	No	Yes	Yes
TIA, TTM, SPA & CP Required	No	Yes	Yes (with more careful consideration of the traffic implications and proposal of more sophisticated TTM schemes)
Time of Delivery	No time restriction	The permitted hours of delivery will depend on the selected route, traffic flows, road conditions, etc., and the results of the TIA acceptable to TD	
Self-arranged Escort (Notes 1 and 2)	No	Yes	
Police Escort (Note 1)	No	No	
Notes:	<p>1. Self-arranged escort is the practice recommended by the police. There are however situations where police escort may be needed, for example, when the delivery crashes with a VIP convoy on the day, there is an accident along the route, etc. Under the above-mentioned special situations, there is no charge for the police escort provided.</p> <p>2. Reference can be made to Section 5.9 of the CoP for the Loading of Vehicles (TD, 2019) on the duties of escort vehicles.</p>		

Annex D – Contacts of the Operators of Eastern Harbour Crossing and Western Harbour Crossing

Tunnel	Operator	Telephone	Fax Number
Eastern Harbour Crossing (EHC)	Pacific Infrastructure Ltd.	23792358/23480011	23475037
Western Harbour Crossing (WHC)	Western Harbour Tunnel Co. Ltd.	23025760/23025888	27369803

APPENDIX F2 - ADVISORY NOTES ON TRAFFIC IMPACT ASSESSMENT FOR MIC PROJECTS

1. Requirements for Traffic Impact Assessment

In the delivery of modules wider than 2.5 m for MiC projects, a Wide Load Permit (WLP) is needed for vehicles carrying the load from the TD's Licensing Office, in accordance with Regulation 54 of the Road Traffic (Registration and Licensing of Vehicles) Regulations (Cap. 374E).

In the WLP application, supporting information, including a Traffic Impact Assessment (TIA), for submission to the relevant Traffic Engineering Division/Regional Office of TD and the Road Management Office (RMO)/Hong Kong Police Force (HKPF) is needed, in particular for the case of load width exceeding 3 m, to demonstrate the practicability of the delivery proposal and time of delivery and its impact on road and junction traffic. Reference should be made to the requirements given in the Guidelines on Application for Wide Load Permit published by TD for preparing the TIA for MiC projects.

2. Objective

The objective of carrying out the TIA is to:

- (a) assess the traffic implications of delivering the MiC modules along a given route from the loading point/port/boundary control point to the building site in each hour for the proposed delivery time period of the day, including entry and exit of the trailers to and from the site to facilitate smooth delivery of the modules;
- (b) based on the data obtained and the analysis carried out, establish that the proposed delivery time period is feasible with due consideration given to other regulatory constraints encountered such as noise⁴⁵ and any physical constraints along the route; and
- (c) devise appropriate traffic improvement/diversion schemes along the route/at junctions and at the building site, as necessary, to ameliorate the traffic impacts to demonstrate that the selected hours of delivery are practical after the proposed traffic improvement/diversion schemes are in place.

3. Contents of Traffic Impact Assessment

3.1 Extent of Study Area

The proposed route covering the roads and junctions should be indicated. Roads and junctions which are identified as key roads/key junctions should be specified. Roads connecting to the key

⁴⁵ The other regulatory constraint that needs to be considered is noise. When construction works, including transportation of modules, are carried out within the restricted hours under the Noise Control Ordinance (NCO) (Cap. 400), a valid Construction Noise Permit (CNP) issued by EPD is needed. A CNP will only be issued if it can be shown with strong justifications that the works can only be carried out within the restricted hours. A good noise management plan is also needed to support the application. Restricted hours are 7:00 pm to 7:00 am or at any time on a general holiday (including Sunday).

roads and adjacent junctions may need to be assessed, if they have an impact on the traffic in the delivery of the modules.

3.2 Street Inventory along the Route

Street name, number of lanes, lane widths, direction of traffic flows, road markings, traffic aids, geometric and characteristics at critical intersections, existing site access points, etc. should be included. On-site measurements of the physical dimensions of the roads along the route at critical points (e.g. junction width, headroom, sightline, etc.) may need to be carried out.

3.3 Existing Traffic Conditions

Traffic counts should be carried out. Traffic data along the key roads/at key junctions in each hour for the proposed delivery time period (± 2 hours) of the day should be collected. Traffic data over a few days are needed to obtain representative data, and at weekends if the delivery of modules is planned for during weekends. The signal phasing and timing at signal-controlled junctions and the public transport services affected should be included. Pedestrian count is also required if existing pedestrian facilities are affected.

3.4 Forecast Traffic Conditions

A forecast of the traffic conditions due to delivery of modules along the key roads/at key junctions (in pcu/hr)⁴⁶ for the proposed delivery time period (± 2 hours) of the day should be made, taking into account size of the modules delivered, type of vehicles/ trailers used (length, no. of axles, flatbed/low bed, etc.), escort arrangement, number of deliveries per day/night/week, road routes to be taken from the loading point/ port/ boundary control point to the building site, start date and end date of the land transport, etc.

3.5 Analysis of Traffic Impacts Due to Delivery of Modules

3.5.1 Link Capacity Analysis

- (a) Design flow to capacity. The design flow of a link is the maximum volume of vehicles using the road with a traffic density that will not give unreasonable delay, hazard or restriction to the drivers the freedom to manoeuvre. The design flows for two way urban roads of different road types can be found in Section 2.4 of the Traffic Planning & Design Manual (TPDM) Vol. 2 (TD, 2020). The design flow of a road will be reduced if the proportion of heavy vehicles/vehicles carrying modules wider than 2.5 m using the road exceeds 15%.
- (b) V/C (volume of vehicles/capacity or volume/capacity) ratio. The V/C ratio is used to reflect the traffic situation along a road. For existing traffic conditions, the volume of vehicles using the road is based on the traffic count data. For traffic conditions with

⁴⁶ Passenger car unit/hour (pcu/hr) is a unit for measuring traffic flow in equivalent number of private cars as design basis. For example, a pcu value of 1.0 is assigned to private cars and taxis. Heavy vehicles such as goods vehicles or buses or vehicles carrying a load wider than 2.5 m which usually travel at a lower speed are assigned higher pcu values.

module delivery, the forecast traffic flow data is used. A V/C ratio equal to or less than 1.0 means that the road has sufficient capacity to cope with the anticipated traffic volume. A V/C ratio between 1.0 and 1.2 indicates a manageable degree of congestion along the road. A V/C ratio above 1.2 indicates a more serious congestion along the road.

- (c) Presentation method. The link capacity of the key roads along a route for existing traffic conditions and forecast traffic conditions with module delivery during the selected hours of delivery should be assessed. A summary of the findings for the hour with the heaviest traffic flow that should be presented is as given in Table 1. As shown in the table, the potential problematic link is Link L29. Link L29 has a V/C ratio of 1.16 for the hour of delivery with the heaviest traffic flow. This implies that there will be congestion along Link 29 for the hour of delivery examined but the congestion is manageable.

Link Index	Road Name (Example)	Direction	Capacity (pcu/hr)	Existing Traffic Conditions		Forecast Traffic Conditions with Module Delivery	
				Flow (pcu/hr)	V/C	Flow (pcu/hr)	V/C
L1	Lung Cheung Rd between Kwun Ton Rd and Clear Water Bay Rd	N/B	6400	2088	0.33	2456	0.38
L29	New Clear Water Bay Rd near Shun Lee Tsuen Rd	W/B	1800	1315	0.73	2081	1.16
Note:	The flow is for the hour with the heaviest traffic flow as obtained from the traffic count.						
Legend:	pcu/hr = passenger car unit/hr						

3.5.2 Junction Capacity Analysis

- (a) Junction types. There are three types of junctions: signal-controlled junctions⁴⁷, priority junctions⁴⁸ and roundabouts⁴⁹.
- (b) Reserve Capacity (RC) (in %). For signal-controlled junctions, RC is used to evaluate the capacity of these junctions. The method of calculation can be found in Section 2.4 of TPDM Vol. 4 and Appendix 1 of the Guidelines on TIA & Day-time Ban Requirements for Road Works on Traffic Sensitive Routes (HyD, 2020). A positive RC figure indicates that the junction is operating with spare capacity, and a negative RC figure indicates that the junction is overloaded, resulting in traffic queues and longer travelling time.
- (c) Design Flow to Capacity (DFC) ratio. For priority junctions and roundabouts, the DFC ratio is used to evaluate the capacity of these junctions. The DFC ratio compares the

⁴⁷ Signal-controlled junctions operate on a time sharing basis. Traffic streams are allowed to enter the junction for a period of time, indicated by an illuminated signals, and during which period conflicting traffic streams are halted.

⁴⁸ Priority junctions operate on the basis that traffic on the major road has continual priority over the traffic on the minor road. Minor road traffic is controlled by “stop” and “give way” signs and associated carriageway marking.

⁴⁹ Roundabouts could be considered as a form of channelized priority junction. Vehicles enter a one way carriageway and move in a clockwise direction around a central island. Entering vehicles give priority to those vehicles already circulating across their entry.

design flow to capacity of the junctions. The methods of calculation of the design flow and capacity can be found in Section 4.2.4, and Appendices 1 and 2 of TPDM Vol. 2 respectively. A DFC ratio of 0.85 indicates the junction has a reasonable capacity which would prevent queueing in the majority (85%) of cases. A DFC ratio of 0.7 indicates that queueing would theoretically be avoided in nearly all (95%) of cases at the junction. A DFC ratio greater than 1.0 indicates that the junction is overloaded.

- (d) Presentation method. The capacity of the key junctions along the route for existing traffic conditions and forecast traffic conditions with module delivery during the selected hours of delivery should be assessed. A summary of the findings for the hour with the heaviest traffic flow that should be presented is as given in Table 2. As shown in the table, the potential problematic junctions are Junctions 11 and 21. Junction 11 has a DFC ratio greater than 1 for the hour of delivery with the heaviest traffic flow. For Junction 21, RC is negative for the hour of delivery with the heaviest traffic flow. This implies that Junctions 11 and 21 will be overloaded.

No.	Junction (Example)	Analysis Type	Existing Traffic Conditions	Forecast Traffic Conditions With Module Delivery
1	New Clear Water Bay Rd/ Clear Water Bay Rd (Upper)	RC	39%	21%
11	Kwun Tong Rd/ Hip Wo St	DFC	0.84	1.2
21	Lin Tak Rd/ Tseung Kwan O Rd/ Sau Mau Ping Rd	RC	5%	-3%

Note: The flow is for the hour with the heaviest traffic flow as obtained from the traffic count.

3.6 Traffic Improvement/Diversion Schemes (or Temporary Traffic Management Schemes)

Recommendation of traffic improvement/diversion schemes to improve traffic flows along the key roads/at key junctions concerned to ameliorate the traffic impacts to facilitate module delivery during the selected hours of delivery, as necessary, should be made. The following schemes, among others, can be considered:

- (a) temporary road/lane closure;
- (b) provision of temporary loading bay, contingency parking place, etc.
- (c) increased signal cycle time;
- (d) localized road widening works;
- (e) conversion of a kerbside lane to left-turn lane;
- (f) provision of a new slip road to enhance traffic capacity;
- (g) provision of new passing lane and bus laybys;
- (h) provision of a new U-turn facility to enhance traffic movement;
- (i) provision of a second gantry at the building site;
- (j) widening of the gantry to say 7.5 m at the building site, etc.

3.7 Capacity Assessment with Traffic Improvement/Diversion Schemes

3.7.1 Implementation of Traffic Improvement/Diversion Schemes

By implementing the proposed traffic improvement/diversion schemes, the identified problematic traffic links and junctions with potential capacity problems induced by the module delivery during the selected hours of delivery can be suitably alleviated.

3.7.2 Presentation Method

The results of the revised link and junction capacity analysis with the traffic improvement/diversion schemes implemented should be provided to justify the findings. A summary of the findings that should be presented is as given in Tables 3 and 4. With the traffic improvement/diversion schemes, the V/C ratio for the potential problematic Link L29 becomes 0.94 for the hour of delivery with the heaviest traffic flow, which means that the road has sufficient capacity. The DFC ratio for Junction 11 becomes 0.95, and RC for Junction 21 becomes positive, which means that both junctions can now operate with spare capacity for the hour of delivery examined.

Link Index	Road Name (Example)	Direction	Capacity (pcu/hr)	Existing Traffic Conditions		Forecast Traffic Conditions with Module Delivery	
				Flow (pcu/hr)	V/C	Flow (pcu/hr)	V/C
L29	New Clear Water Bay Rd near Shun Lee Tsuen Rd	W/B	1800	1315	0.73	1700	0.94
Note: The flow is for the hour with the heaviest traffic flow as obtained from the traffic count.							
Legend: pcu/hr = passenger car unit/hr							

No.	Junction (Example)	Analysis Type	Existing Traffic Conditions	Forecast Traffic Conditions With Module Delivery
11	Kwun Tong Rd/ Hip Wo St	DFC	0.84	0.95
21	Lin Tak Rd/ Tseung Kwan O Rd/ Sau Mau Ping Rd	RC	5%	2%
Note: The flow is for the hour with the heaviest traffic flow as obtained from the traffic count.				

3.8 Other Analyses

Based on the details given in the above sections, swept path analyses supported by drawings to demonstrate the maneuverability of the vehicles at critical road sections such as narrow road segments, sharp bends, junctions, vehicular ingress and egress to destination/site, etc., should be carried out. A contingency plan to handle emergency situations, including the rescue arrangement for breakdown of transportation vehicle, evacuation proposal when the delivery route is being blocked

by other vehicles, and procedures for reporting incidents to relevant personnel, etc., should be included as appropriate.

3.9 Conclusions and Recommendations

This section should be provided in the TIA Report to cover the following:

- (a) summary of existing traffic conditions and forecast traffic conditions with module delivery for the hours of delivery examined;
- (b) recommendations of traffic improvement/diversion schemes to facilitate module delivery during the selected hours of delivery;
- (c) summary of forecast traffic conditions with module delivery with the recommended traffic improvement/diversion schemes in place;
- (d) summary of findings from the swept path analysis and details of the contingency plan;
- (e) recommendation for other measures such as trial run before implementation of the delivery, need for escort vehicles, etc.
- (f) recommendation for consultation, as necessary, etc.



Feedback Form

Reference Material on the Statutory Requirements for Modular Integrated Construction Projects (September 2020)

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