Modular Integrated Construction

INNOVATIONS

under Buildings Ordinance and allied Legislations

Lawsons YUE | Technical Secretary/Building
Fion AU | Technical Secretary/Structural

06.11.2018

Technical Services Unit

Collaborative Timeline


Buildings Department — Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers — ADV-36

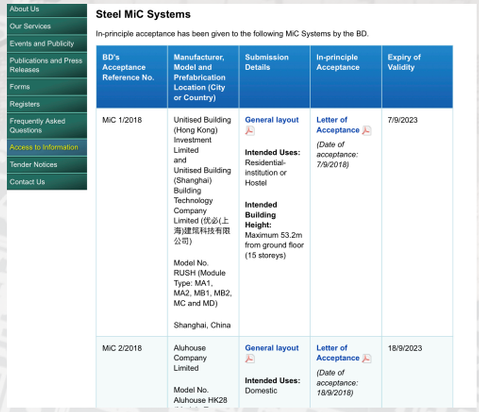
Modular Integrated Construction

Introduction

Modular Integrated Construction (MiC) refers to a construction method whereby free-standing volumetric modules (with finishes, fixtures, fittings, etc.) are manufactured off-site and then transported for constructing buildings. Proven benefits include improved site safety, more efficient and better quality control, shortened construction period, less construction waste, less demand for on-site labour, less disturbance and nuisance to the neighbourhood, etc., not just contributing to the quality and sustainable built-environment but also help ease some of the challenges of the local construction industry. To encourage MiC, the Buildings Department (BD) has formulated streamlined measures and guidelines to facilitate the industry in meeting the relevant standards and requirements under the Buildings Ordinance (BO).

Considerations Unique to MiC

2. Similar to the use of prefabricated building components, the project team should engage the MiC suppliers at the early design stage to sort out the issues usually


Steel MiC Systems

In-principle acceptance has been given to the following MiC Systems by the BD.

BD's Acceptance Reference No.	Manufacturer, Model and Prefabrication Location (City or Country)	Submission Details	In-principle Acceptance	Expiry of Validity
MiC 1/2018	Unitised Building (Hong Kong) Investment Limited and Unitised Building (Shanghai) Building Technology Company Limited (优远(上海)建筑科技有限公司) Model No. RUSH (Module Type: MA1, MA2, MB1, MB2, MC and MD) Shanghai, China	General layout **Intended Uses:** Residential-institution or Hostel **Intended Building Height:** Maximum 53.2m from ground floor (15 storeys)	Letter of Acceptance *(Date of acceptance: 7/9/2018)*	7/9/2023
MiC 2/2018	Aluhouse Company Limited Model No. Aluhouse HK28	General layout **Intended Uses:** Domestic	Letter of Acceptance *(Date of acceptance: 18/9/2018)*	18/9/2023

Nov 2017
Launch of Pre-acceptance Mechanism

Dec 2017
Issue of PNAP ADV-36 on MiC

April 2018
Submissions Received

Sept 2018
Grant of the First In-principle Acceptance

Focus Groups, Meetings with AP/RSE/Applicants

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PROCESS

Pre-submission Enquiry
On specific design principle/ construction standard

45 Days

Both Site Specific & Non-site Specific

Building Proposal
Modularisation on DfMA Concept

Formal Plan Submissions
Circulations through Centralised Processing System

Modifications
Referral to Building Committee and Structural Engineering Committee

Quality Supervision
Submission of Quality Assurance Scheme and Supervision Plan

Site Specific

APPROVAL

60 Days

CONSENT

28 Days

MiC Supplier
Procurement/ Partnership

Application for In-principle Acceptance (IPA)
Proposal +
Form MiC 1/MiC 2

Modifications
Non-site Specific/ Site Specific

45 Days

Grant of IPA
Unique IPA Reference Enlisted in BD Website

Non-site Specific

PEOPLE

Project Proponents

Developer

Authorized Person

Technical Services Unit

Registered Structural Engineer

New Buildings Divisions

MiC Supplier

Buildings Department

Considerations Unique to MiC

Buildings Department	Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers	ADV-36

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Considerations Unique to MiC

2. Similar to the use of prefabricated building components, the project team should engage the MiC suppliers at the early design stage to sort out the issues usually not encountered in conventional in-situ construction. Apart from the extent of standardisation and buildability of such modules, the mode of delivery with due regard to the specific site conditions, the issues that may arise from meeting the relevant requirements including those on supervision as well as the programme of plan submissions to the BD should be considered in advance. General guidelines on the

Considerations Unique to MiC

- Fire Safety
- Joints and Gaps
- Structural Design
- Provisions for Maintenance

Essential Information

Appendix C
(PNAP ADV-36)

Pre-acceptance Application Checklist for MiC

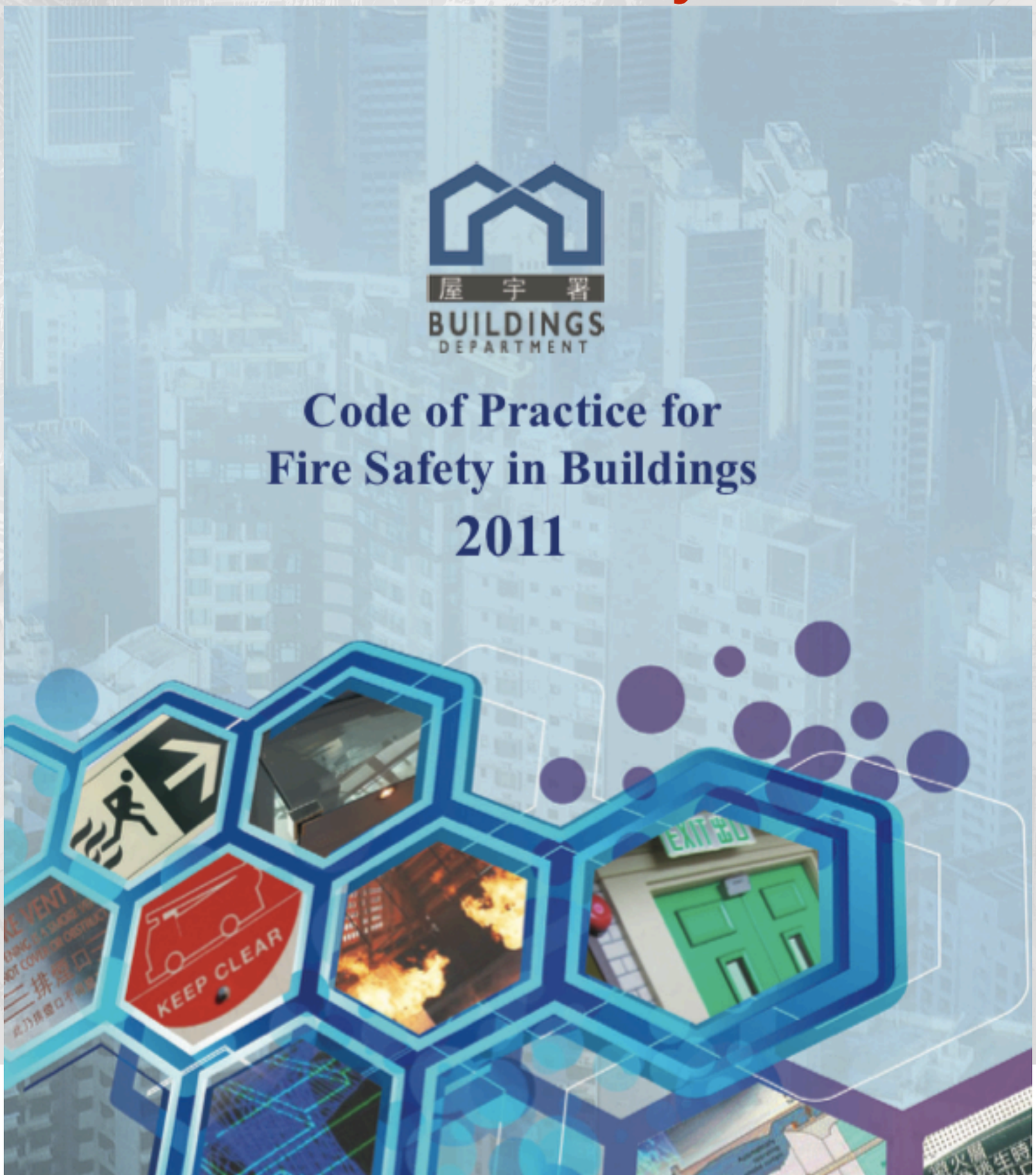
This application checklist aims to remind AP and RSE of the essential information which should be contained in the plans and supporting documents accompanied with the application. The checklist should be completed by ticking the items relevant to the application and any other information essential for the MiC system should be listed out in Section 10.

The BD will conduct regular review on this application checklist in the light of experience gained in processing different MiC systems, feedbacks from the building industry on the use of various MiC systems and technological development in the relevant fields.

○ Essential information to be provided on plans
△ Essential information to be provided in the supporting document accompanied with the plans

Section		Essential Information
1.	General	○ General notes on compliance with applicable regulations / codes of practice / design manual / guidelines ○ General building plans (plans of all floors, sections and all elevations) in scale not less than 1:100 with full dimensions ○ Structural plans in scale not less than 1:100 showing the layout and dimensions of all structural elements, modular units, structural connections and locations of movement joints ○ Intended height and use of building

Fire Safety


屋宇署
BUILDINGS
DEPARTMENT
Code of Practice for
Fire Safety in Buildings
2011
KEEP CLEAR
EXIT

Fire Safety

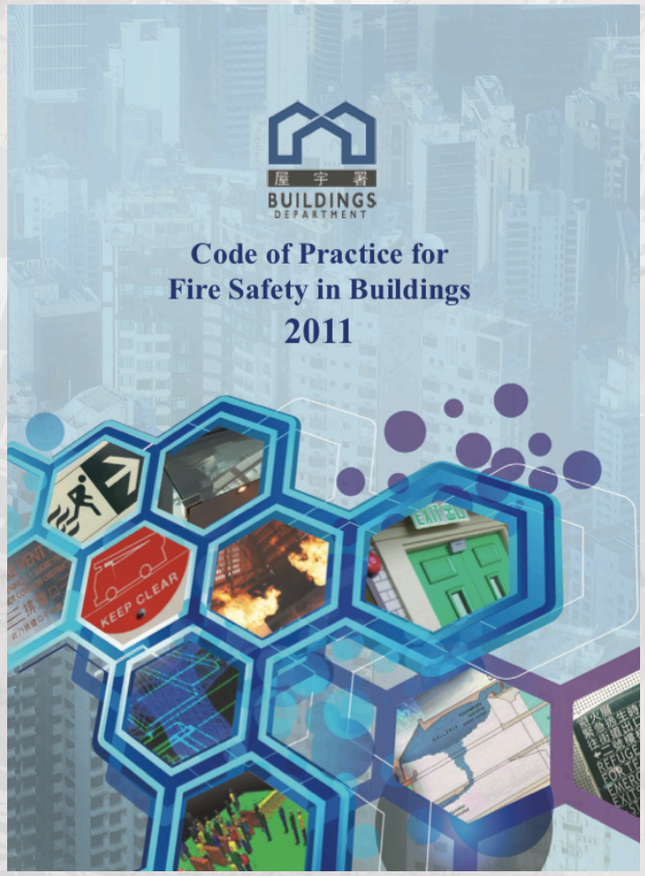
- Clause C4.1
  (Elements of Construction)

- Clause C6.1
  (Protection of Flats)

- Clause C7.1
  (Different Uses/Occupancies)

- Clause C11.1
  (External Fire Spread)

- Part E
  (*Fire Properties of Building Elements)*



Fire Safety

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  (Elements of Construction)
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- Part E
  (*Fire Properties of Building Elements)*

Table C2: Fire Resistance Rating Criteria for Elements of Construction, Fire Barriers and Other Components

Elements of construction or other components		Criteria to be satisfied			Method of Exposure
		Stability	Integrity	Insulation	
1	Structural frame, beam or column	Y	N	N	Exposed faces only
2	Floor including fire compartment floor	Y	Y	Y	Each side separately
3	Roof forming part of an exit route or performing the function of the floor	Y	Y	Y	From underside
4	Loadbearing wall not being a fire barrier	Y	N	N	Each side separately
5	External wall	Y*	Y	Y	Each side separately
6	Loadbearing wall being a fire barrier	Y	Y	Y	Each side separately
7	Non-loadbearing wall being a fire barrier	N	Y	Y	Each side separately
8	Protected shaft, lobby and corridor	Y*	Y	Y	Each side separately
9	Fire shutter, fire stop, fire dampers, sealing system	N	Y	N (unless specified)	Each side separately
10	Smoke outlet shaft	Y	Y	Y	From outside
11	Enclosure around services other than Item 14	N	Y	Y	From outside
12	Door (including frame and fixing)	N	Y	N (unless specified)	Each side separately (except lift doors – from landing side only)
13	Fixed light (including frame, glazing & fixing)	N	Y	Y	Each side separately
14	Enclosure around services in required staircase/protected lobby	N	Y	Y	Each side separately

Fire Safety

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  (Elements of Construction)
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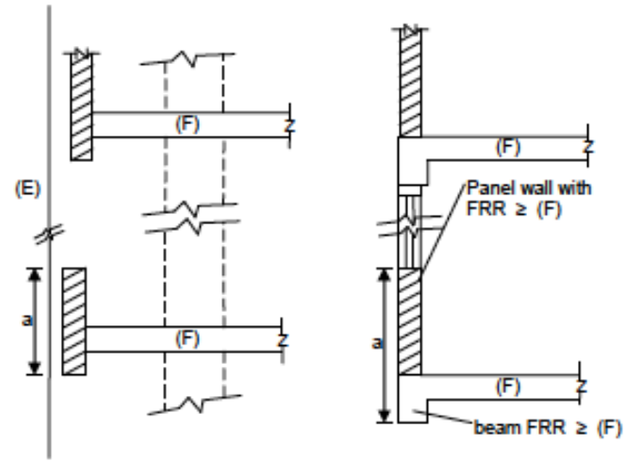
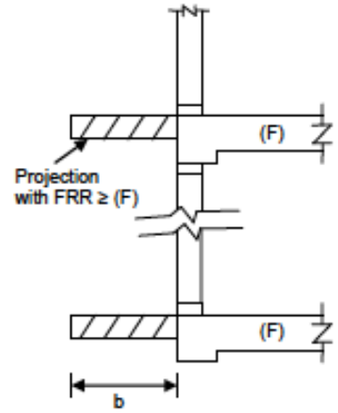
Diagram C7: Protection against Spread of Fire by Spandrels (see Clause C11.1)





(F)	FRR of Intervening floor
	Spandrel having FRR ≥ that of (F)
	a ≥ 900 mm b ≥ 500 mm
(E)	External wall (e.g. curtain wall) with no FRR or FRR < that of (F)

Fire Safety

Item	Location of Application	Product Name	Description of Construction	Performance	Testing Standard	Details of Test or Assessment Report				
						Name of Accreditation Body	Name of Laboratory / Assessing Organisation	Report No.	Date of Test / Report	Validity Date
Loadbearing Element	Structural Frame including Beam and Column									
	Wall									
	Floor									
Non-loadbearing Element	Separation Wall									
	Spandrel									
Protection of Openings in Fire Barriers	Door									
	Sealant									
	Collar									
	Damper									
Linings and Insulation	External Wall									
	Internal Partition									
	Air Duct (External)									
	Air Duct (Internal)									
Others	Cavity Barrier									

- Part E
  (*Fire Properties of Building Elements)*

Joints and Gaps

- B(C)R 41 & 48
  (Weatherproof)

- Subsection C8 of FS Code 2011
  (*Openings through Fire Barrier)*

- B(C)R 90
  (Cavity Barrier)

Structural Design

- Stability
- Robustness and Integrity
- Design for Temporary Stages
- Design for Movements
- Method Statement of Installation

Provisions for Maintenance

- Pipe Duct (PNAP APP-93)
- Sucken Slab
- Recess at Strategic Locations
- Design for Safety
- User Manual