Hong Kong Concrete Institute
Annual Seminar 2022

Approval of Innovations In Construction

Ir AU-YEUNG Hoi-pang
Assistant Director/New Buildings 2
Buildings Department

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Buildings Ordinance (Cap.123)

Part 2
Control of Building

14. Approval and consent required for commencement of building works, etc.

(1) Save as otherwise provided, no person shall commence or carry out any building works or street works without having first obtained from the Building Authority—

(a) his **approval** in writing of documents submitted to him in accordance with the regulations; and

(b) his **consent** in writing for the commencement of the building works or street works shown in the approved plan.

Buildings Ordinance (Cap.123)

PART XII

STRUCTURAL USE OF CONCRETE

Materials

50. Cement

(1) Cement for concrete shall be ordinary, rapid hardening or sulphate resisting Portland cement of such composition, manufacture and chemical and physical properties as are suitable for the production of concrete.
(2) High alumina cement shall not be used for concrete.

51. Aggregate

(1) Subject to subregulations (2) and (3) aggregates used shall be crushed or uncrushed natural mineral substances and shall comply with the quality and grading requirements suitable for the production of concrete.
(2) Separate fine and coarse aggregate shall be used for concrete.
(3) No concrete containing embedded metal shall have in it unwashed marine sand.

52. Water

Water for concrete shall be clean, fresh water free from harmful matter.

53. Admixtures

(1) The admixtures used for concrete shall be suitable and effective for the purpose of modifying the workability, rate of stiffening or hardening, or colouring of concrete.
(2) The chloride ion content of admixtures for concrete containing embedded metal or for concrete containing sulphate resisting Portland cement shall not exceed 2% by mass of admixture or 0.03% by mass of the cementitious content, whichever is the less.

54. Reinforcement

Reinforcement for concrete shall be hot rolled steel bars, cold reduced steel wire or steel fabric of suitable composition, manufacture, and chemical and physical properties.

Part 2

Requirements for Materials

3. Materials

(1) All materials used in building works or street works must be—

(a) of a nature and quality suitable for their intended use or purpose;

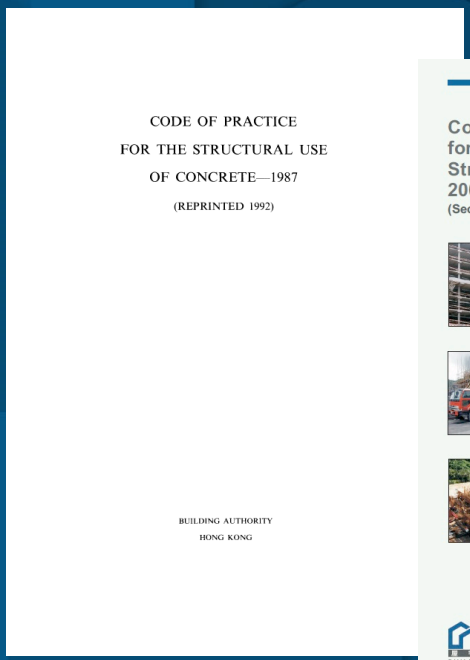
(b) adequately mixed or prepared; and

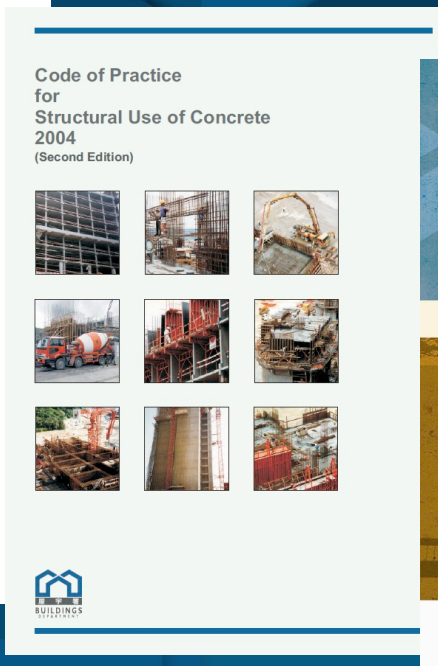
(c) applied, used or fixed so as to perform adequately their intended functions.

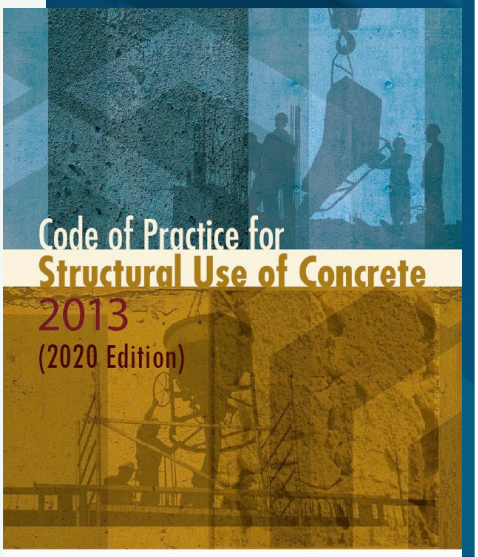
(2) To ensure that subsection (1) is complied with, the materials used must be adequately tested by recognized tests.

Code of Practices

Code of Practice for the Structural Use of Concrete







Pre-submission Enquiry

Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers (PNAP) ADM-19

Pre-submission Enquiry and Conference

4. AP, RSE and RGE may wish to **settle the design principles involved at an early stage** so that they can proceed with confidence and avoid abortive work. To facilitate **early clearance of basic design principles before formal submission of plans**, BD will upon receipt of a written enquiry provide a determination on the matters involved in the form of a "letter of assurance" normally within 45 days. BD may hold pre-submission conferences with AP/RSE/RGE and invite representatives of concerned Government departments to discuss and examine the issues and principles involved.

5. It is recommended that AP/RSE/RGE should make use of this service to consult BD as early as possible on the **use of any new structural theory, materials or systems, sophisticated designs and unconventional construction methods** prior to preparing the detailed design.

Structural Engineering Committee (SEC)

The SEC acts as a standing body for formulating policies on structural engineering matters, interpretation of Buildings Ordinance and Building (Construction) Regulations pertinent to structural engineering, giving directives on the approach in **dealing with unprecedented, not generally accepted, complex, unusual or controversial structural problems arising from building developments.**

AD/NB2

CSE (Other Div) | **CSEs in NBD2** | **CSE/ICU**

SSE/TS (Secretary)

SSE/Adv (in attendance)

Central Data Bank (CDB)

The CDB contains only **historical** information on material acceptance in respect of a building development. Therefore, the Buildings Department **will not accept** direct application from a supplier, manufacturer or alike for including its products in the CDB.

List of Building Materials:

- Concrete Admixtures
- Fire Protection Materials for Structural Use
- Fire-stop Materials for Curtain Walls
- Fire-stop Materials and Sealing System
- Mechanical Couplers
- Structural Fixing
- Structural Sealant

Pre-acceptance Mechanism

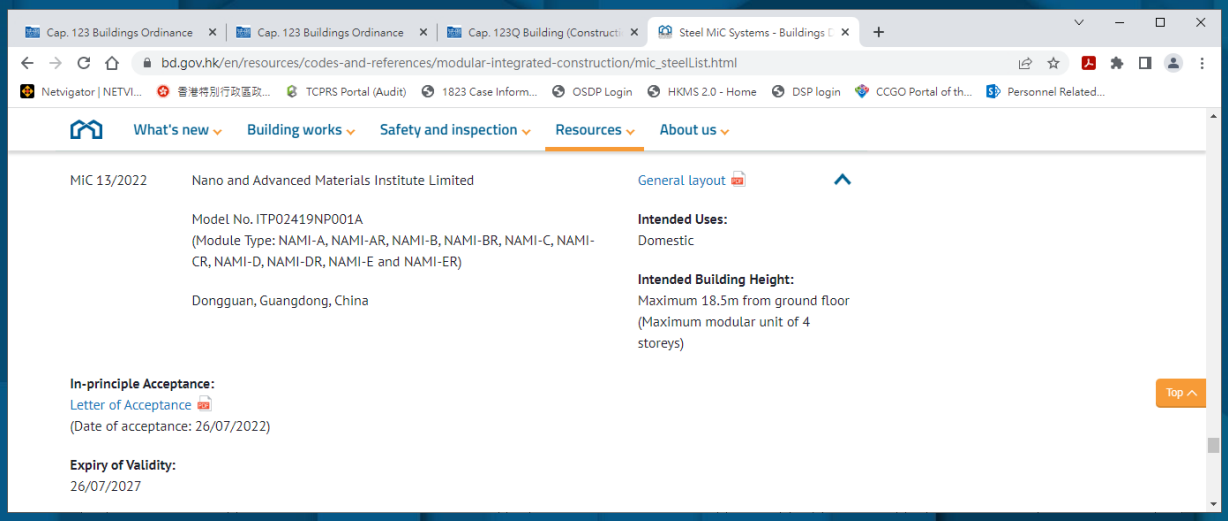
With a view to facilitating wider use of Modular Integrated Construction (MiC) for private building developments in Hong Kong, the Buildings Department (BD) has set up a pre-acceptance mechanism for granting **in-principle acceptance to MiC systems / components**.

MiC systems accepted by the BD are shown in BD website for reference by the public and practitioners.

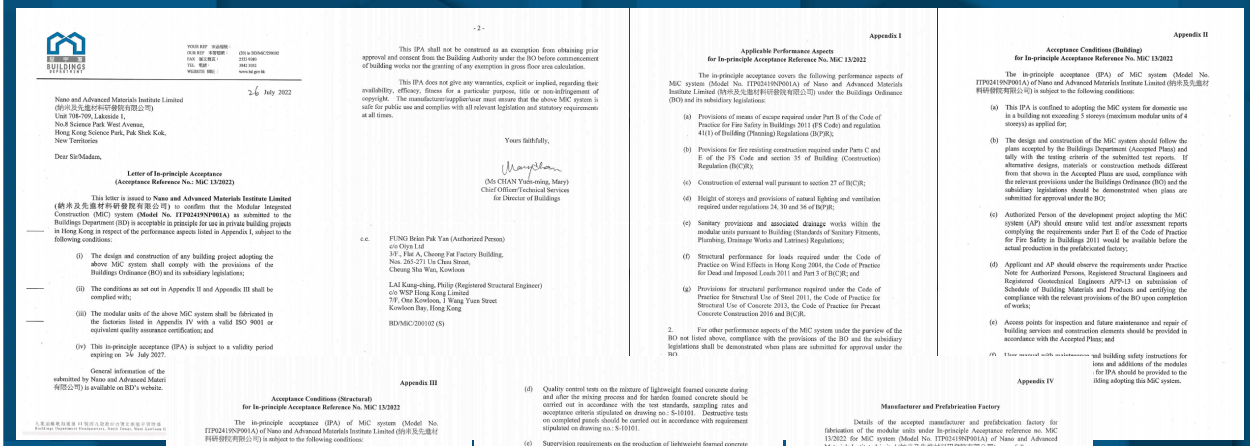
Status of In-principle Approval (IPA) (as at 30.11.2022)

No. of Applications Received	147 (Concrete: 55, Steel: 91, Aluminium: 1)
No. of MiC Systems with IPA Granted	68 (Concrete: 25, Steel: 43)

Pre-acceptance Mechanism



Pre-acceptance Mechanism



Nano and Advanced Materials Institute Limited
(納米及先進材料研發院有限公司)
Unit 708-709, Lakeside 1,
No.8 Science Park West Avenue,
Hong Kong Science Park, Pak Shek Kok,
New Territories

26 July 2022

Dear Sir/Madam,

Letter of In-principle Acceptance
(Acceptance Reference No.: MiC 13/2022)

This letter is issued to **Nano and Advanced Materials Institute Limited** (納米及先進材料研發院有限公司) to confirm that the Modular Integrated Construction (MiC) system **(Model No. ITP02419NP001A)** as submitted to the Buildings Department (BD) is acceptable in principle for use in private building projects in Hong Kong in respect of the performance aspects listed in Appendix I, subject to the following conditions:

(i) The design and construction of any building project adopting the above MiC system shall comply with the provisions of the Buildings Ordinance (BO) and its subsidiary legislations;

(ii) The conditions as set out in Appendix II and Appendix III shall be complied with;

(iii) The modular units of the above MiC system shall be fabricated in the factories listed in Appendix IV with a valid ISO 9001 or equivalent quality assurance certification; and

(iv) This in-principle acceptance (IPA) is subject to a validity period expiring on 26 July 2027.

General information of the submitted by Nano and Advanced Materi (納米及先進材料研發院有限公司) is available on BD's website.

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This IPA shall not be construed as an exemption from obtaining prior approval and consent from the Building Authority under the BO before commencement of building works nor the granting of any exemption in gross floor area calculation.

This IPA does not give any warranties, explicit or implied, regarding their availability, efficacy, fitness for a particular purpose, title or non-infringement of copyright. The manufacturer/supplier/user must ensure that the above MiC system is safe for public use and complies with all relevant legislation and statutory requirements at all times.

Yours faithfully,

(Ms CHAN Yuen-ming, Mary)
Chief Officer/Technical Services
for Director of Buildings

c.c. FUNG Brian Pak Yan (Authorized Person)
c/o Oyn Ltd
3/F., Flat A, Choeng Fat Factory Building,
Nos. 265-271 Un Chau Street,
Cheung Sha Wan, Kowloon

LAI Kung-ching, Philip (Registered Structural Engineer)
c/o WSP Hong Kong Limited
7/F, One Kowloon, 1 Wang Yuen Street
Kowloon Bay, Hong Kong

BD/MiC/200102 (S)

Appendix I

Applicable Performance Aspects
for In-principle Acceptance Reference No. MiC 13/2022

The in-principle acceptance covers the following performance aspects of MiC system (Model No. ITP02419NP001A) of Nano and Advanced Materials Institute Limited (納米及先進材料研發院有限公司) under the Buildings Ordinance (BO) and its subsidiary legislations:

(a) Provisions of means of escape required under Part B of the Code of Practice for Fire Safety in Buildings 2011 (FS Code) and regulation 41(1) of Building (Planning) Regulations (B(P)R);

(b) Provisions for fire resisting construction required under Parts C and E of the FS Code and section 35 of Building (Construction) Regulation (B(C)R);

(c) Construction of external wall pursuant to section 27 of B(C)R;

(d) Height of storeys and provisions of natural lighting and ventilation required under regulations 24, 30 and 36 of B(P)R;

(e) Sanitary provisions and associated drainage works within the modular units pursuant to Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations;

(f) Structural performance for loads required under the Code of Practice on Wind Effects in Hong Kong 2004, the Code of Practice for Dead and Imposed Loads 2011 and Part 5 of B(C)R; and

(g) Provisions for structural performance required under the Code of Practice for Structural Use of Steel 2011, the Code of Practice for Structural Use of Concrete 2013, the Code of Practice for Precast Concrete Construction 2016 and B(C)R.

2. For other performance aspects of the MiC system under the purview of the BO not listed above, compliance with the provisions of the BO and the subsidiary legislations shall be demonstrated when plans are submitted for approval under the BO.

Appendix II

Acceptance Conditions (Building)
for In-principle Acceptance Reference No. MiC 13/2022

The in-principle acceptance (IPA) of MiC system (Model No. ITP02419NP001A) of Nano and Advanced Materials Institute Limited (納米及先進材料研發院有限公司) is subject to the following conditions:

(a) This IPA is confined to adopting the MiC system for domestic use in a building not exceeding 5 storeys (maximum modular units of 4 storeys) as applied for;

(b) The design and construction of the MiC system should follow the plans accepted by the Buildings Department (Accepted Plans) and tally with the testing criteria of the submitted test reports. If alternative designs, materials or construction methods different from that shown in the Accepted Plans are used, compliance with the relevant provisions under the Buildings Ordinance (BO) and the subsidiary legislations should be demonstrated when plans are submitted for approval under the BO;

(c) Authorized Person of the development project adopting the MiC system (AP) should ensure valid test and/or assessment reports complying the requirements under Part E of the Code of Practice for Fire Safety in Buildings 2011 would be available before the actual production in the prefabricated factory;

(d) Applicant and AP should observe the requirements under Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers APP-13 on submission of Schedule of Building Materials and Products and certifying the compliance with the relevant provisions of the BO upon completion of works;

(e) Access points for inspection and future maintenance and repair of building services and construction elements should be provided in accordance with the Accepted Plans; and

(f) User manual with maintenance and building safety instructions for ions and additions of the modules for IPA should be provided to the ilding adopting this MiC system.

Appendix III

Acceptance Conditions (Structural)
for In-principle Acceptance Reference No. MiC 13/2022

The in-principle acceptance (IPA) of MiC system (Model No. ITP02419NP001A) of Nano and Advanced Materials Institute Limited (納米及先進材料研發院有限公司) is subject to the following conditions:

(a) The design and construction of MiC system should follow the plans accepted by the Buildings Department (Accepted Plans) and tally with the testing criteria of the submitted test reports. If alternative designs, materials, proprietary products or construction methods different from that shown in the Accepted Plans are used, compliance with the relevant provisions under the Buildings Ordinance (BO) and the subsidiary legislations should be demonstrated when future plans are submitted for approval under the BO;

(b) The MiC system is accepted based on the assumptions listed below. Overall stability, structural analysis, adequacy of structural member and/or structural connections, lateral deflection etc. should be checked when there are any deviations with future structural plans submitted for approval under the BO.

(i) Maximum building height from Ground Floor of 18.5m;

(ii) Maximum modular units of 4 storeys;

(iii) Maximum design wind pressure of 2.20kPa (unfactored);

(iv) Imposed loads, superimposed loads and assumed façade loads as shown on drawing no.: S-11002. Imposed loads for vehicular traffic and parking are not considered;

(v) Lateral stability is provided by the in-situ RC core walls;

(vi) Fabrication and installation tolerances of modular units as shown on drawing no.: S-10100;

(vii) Capacity of structural connection of modular unit as shown on drawing no.: S-12007; and

(viii) No modular units are stacked more than one-storey above the completed level of each zone as shown on drawing no.: S-11003.

(c) Structural details of internal partition wall and roof floor above 4/F modules are not included in this acceptance.

(d) Quality control tests on the mixture of lightweight foamed concrete during and after the mixing process and for harden foamed concrete should be carried out in accordance with the test standards, sampling rates and acceptance criteria stipulated on drawing no.: S-10101. Destructive tests on completed panels should be carried out in accordance with requirement stipulated on drawing no.: S-10101.

(e) Supervision requirements on the production of lightweight foamed concrete stipulated on drawing no.: S-10101 should be followed. In addition, the critical inspection items summarized on drawing no.: S-10101 should be covered in the inspections conducted by the QCST and QCCI.

(f) Plant trails should be carried out in accordance with the requirements stipulated on drawing no.: S-10101. A report summarizing the findings of plant trails should be submitted to the Building Authority prior to the actual commencement of production of precast lightweight foamed concrete.

Appendix IV

Manufacturer and Prefabrication Factory

Details of the accepted manufacturer and prefabrication factory for fabrication of the modular units under In-principle Acceptance reference no. MiC 13/2022 for MiC system (Model No. ITP02419NP001A) of Nano and Advanced Materials Institute Limited (納米及先進材料研發院有限公司) are as follows:

Manufacturer:	Nano and Advanced Materials Institute Limited (納米及先進材料研發院有限公司)	
Prefabrication Factory	Address of Prefabrication Factory	Production
Wing Hong Shun Enterprises Limited	Huizhou City Wing Hong Shun Construction Material Co., Ltd. Bailianbu Village Longxi Town Boluo Huizhou Guangdong People's Republic of China 516123	Precast lightweight foamed concrete
Chevalier (Construction) Company Limited Chevalier (Aluminium Engineering) Hong Kong Limited	中國廣東省東莞市茶山鎮東沿路196號	Fabrication of modular units

Remarks:

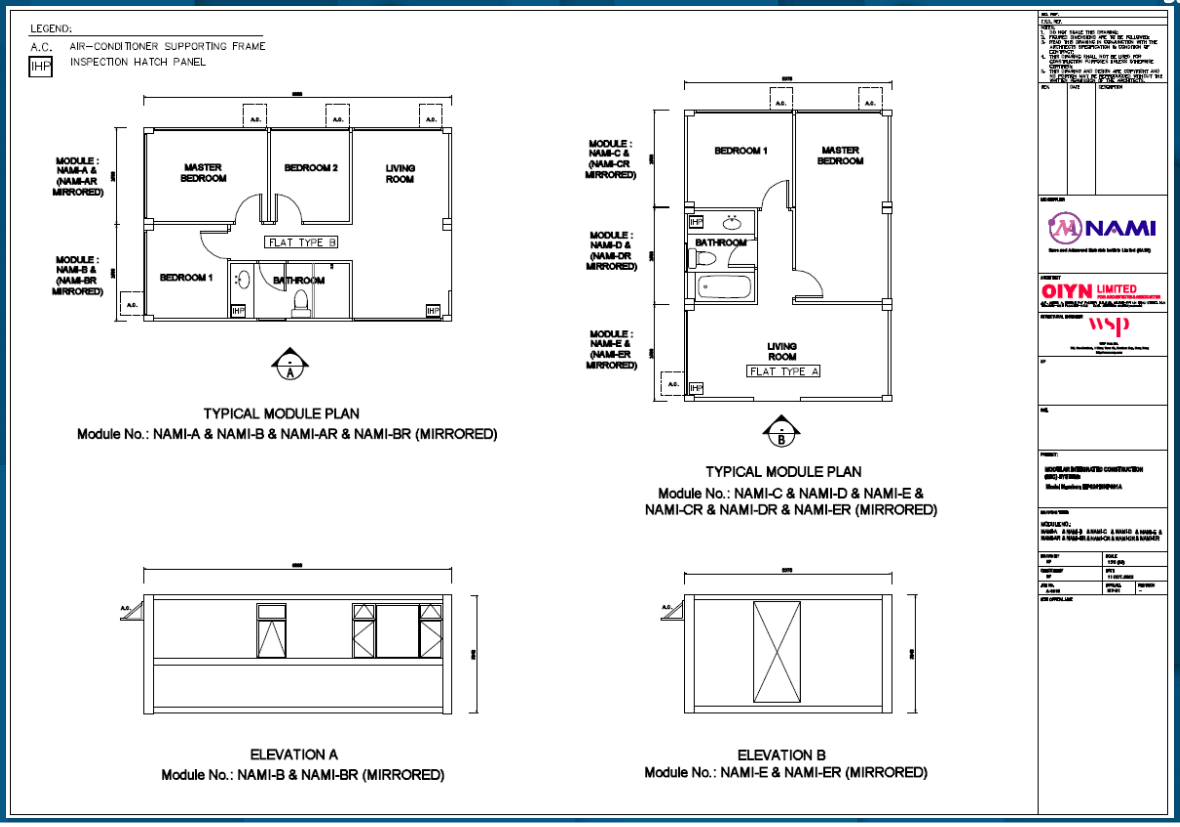
(a) The above factory shall maintain a valid ISO 9001 or equivalent quality assurance certification at all times.

(b) The following items in the Quality Assurance Scheme are for information only. Updated information should be submitted for future building projects with MiC.

(i) Frequency and extent of inspection by in-house staff and independent parties required in Appendix B of Practice Notes for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers (PNAP) ADV-36; and

(ii) Frequency and extent of audit by in-house staff and independent parties required in Appendix B of PNAP ADV-36.

Pre-acceptance Mechanism



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Successful cases

- Steel H-pile grouted in pre-bored holes of 550 mm diameter With post-pressurised grout in colluvium and CDG;
- Use of proprietary monolithic acrylic panel (100mm+) for construction of a base of an indoor swimming pool;
- Use of Modified Socketed Steel H-Pile Formed by Welding Two Steel Plates to the Flanges of a Recognized Steel H-Pile Socketed into Rock;
- Use of lightweight foamed concrete for structural slab and external non-load bearing walls of MiC modules;
- Monitoring early compressive strength of insitu concrete by maturity method; and etc


屋 宇 署
BUILDINGS DEPARTMENT
Thank You