



 盈電工程有限公司  
REC Engineering Company Limited  
(A wholly-owned subsidiary of Yau Lee Holdings Limited)

## EXPERIENCE SHARING OF MIC/MIMEP FSD STAFF QUARTERS IN PAK SHING KOK

Ir Antonio C M Chan  
Deputy Managing Director

- Introduction of Yau Lee Holdings Ltd. & REC Engineering Co. Ltd.
- Modulated Integrated Construction (MiC) and its Merits
- Staff Quarters for FSD Fact Sheet
- Project MiC Development
- Tender Scheme Vs MiC Scheme
- Statutory Inspection Requirements
- MEP Scope of Works in MiC Modules
- Production Area
- Video Sharing in MiC Lifting
- Beauty and the Beast
- Q&A





**We Build We Serve We Create**

**Strong vertical supply chain | Specializes in Modular Fast Track Construction | Total Green Solutions**

Public Housing Estate



Design & Build Hospital and Government Office Building



Fitting Out, Building Renovation & Maintenance



Property Development



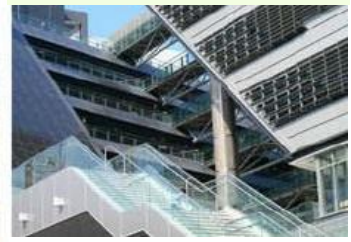
Hotel Development



Concrete Precast/GRC/GRG/GRP



Curtain Wall and Steel Works



Themed Painting



Architectural Services



Construction Technologies



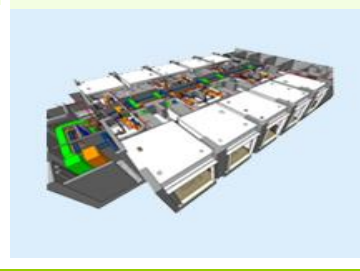
Electrical/Mechanical/P&D



Green Technologies & Solutions



Virtual Design & Construction



Intelligent Concrete



Low Carbon Materials





Established in 1966, became part of Yau Lee Holdings Ltd. in 2008 and renamed as REC Engineering Co. Ltd. in 2009 Operates also in Macao, China PRC as well as Singapore offering MEP Services

**MEP** – Mechanical, Electrical and Plumbing Contractor active in both Public/Private projects 屋宇裝備專業承判商

**EES** – Environmental Engineering Services covering Water, Sewage and Solid Waste Treatment 環保工程專業承判商

**GES** – General Engineering Services offering A&A, O&M and TMC services 維修保養工程

**TS** – Tin Sing offering water analysis and chemical treatment services 水板分析及水處理

**RGT** – REC Green Technologies offering Energy Optimization Solution hardware 能源優化系統

**RGE** – REC Green Energy Solution offering Energy Optimization Solution software 能源優化方案

**O-Link** – Your MiMEP Partner offering qualitative Robotic Welding services 精準機械人燒焊方案





# Introduction

- **Modular Integrated Construction (MIC)** is an innovative construction method whereby free-standing integrated modules (completed with finishes, fixtures and fittings) manufactured in a prefabrication factory then transported to construction site for installed to form a building.



Nam Cheong 220



FSD Qtrs in Pak Shing Kok



InnoCell in Science Park

and many mores to come

**Cost Effectiveness** : focus more in factory assembly before on-site construction while different modules can be assembled alongside with foundation works leading to less labour on-site, shorter construction time, improved productivity

**Improve environmental sustainability** : reduce construction waste as modules are assembled in factory

**Enhance labour efficiency** : labour shortage in construction industry

**Enhance Quality** : better quality in controlled environment

**Reduce on-site accident** : risk related working at height can be reduced

**Safety enhanced** : impact of adverse weather is reduced as assembly work is being conducted in factory



# Staff Quarter Project



Contract No. SS E502 (Prog. No. 64JA)  
Design and Construction of  
Rank and File Quarter for  
Fire Services Department  
At Area 106, Pak Shing Kok,  
Tseung Kwan O

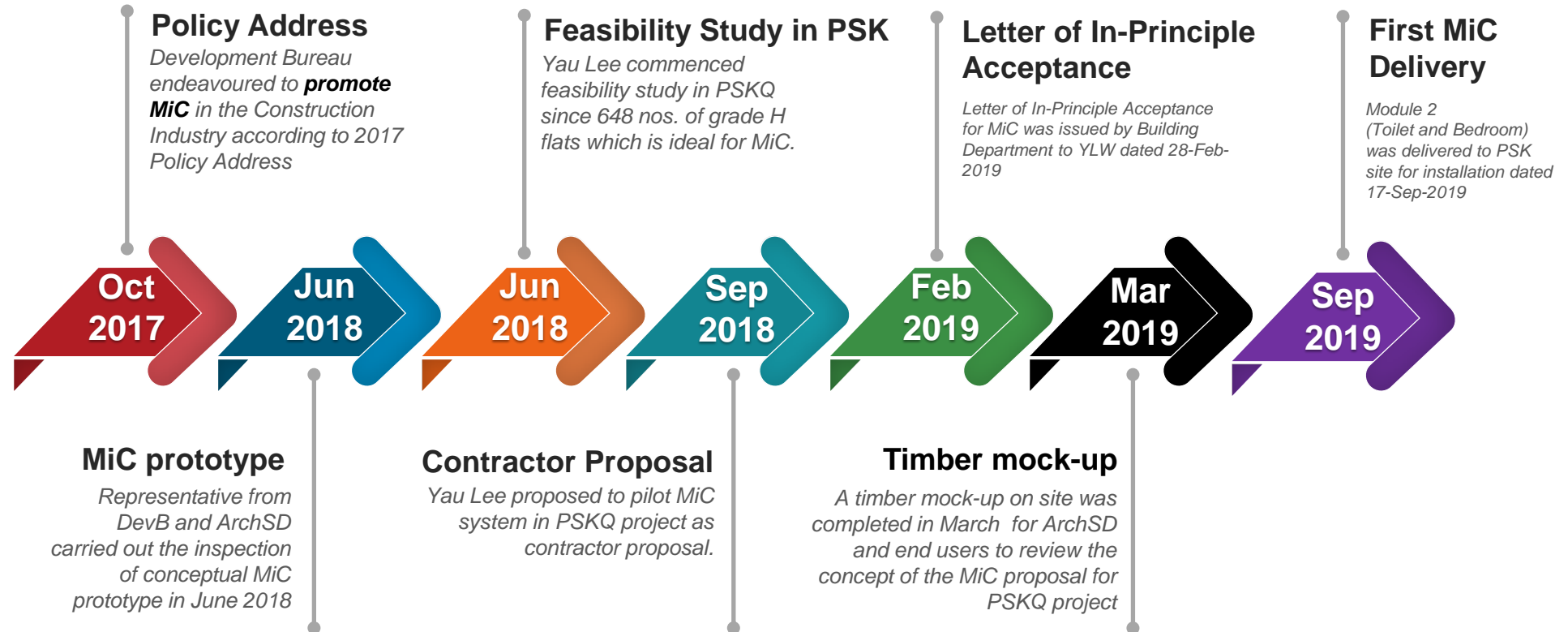


## Development Parameters

Site location	: Area 106, Pak Shing Kok, Tseung Kwan O
Land Use	: G/IC(4)
Class of Site	: A
Site Area	: 12388m <sup>2</sup>
Site Coverage for Domestic (Permitted)	: 35%
Site Coverage for Non-Domestic under 15m (Permitted)	: 100%
Plot Ratio for Domestic	: 3.1
Total Gross Floor Area	: 38402m <sup>2</sup>
Net Operational Floor Area (NOFA) +Saleable Floor Area(SA)	: 32467m <sup>2</sup> (NOFA+SA:32400m <sup>2</sup> of flat)
Height Restriction	: 52m (Building Height)
No. of Residential Floors above G/F & LG	: 16-17
No. of Towers	: 5
No. of 50m <sup>2</sup> Quarter Units (Nos.)	: 648
Car Park	
No. of Car Parking Space (including Visitor and Disabled)	: 25 + 1
(including Private and Disabled)	: 74 + 2
No. of Motorcycle Parking	: 7
No. of Loading & Unloading Bay	: 5



# MiC Development



1<sup>st</sup> Conceptual Concrete MiC in YLW (June 2018)

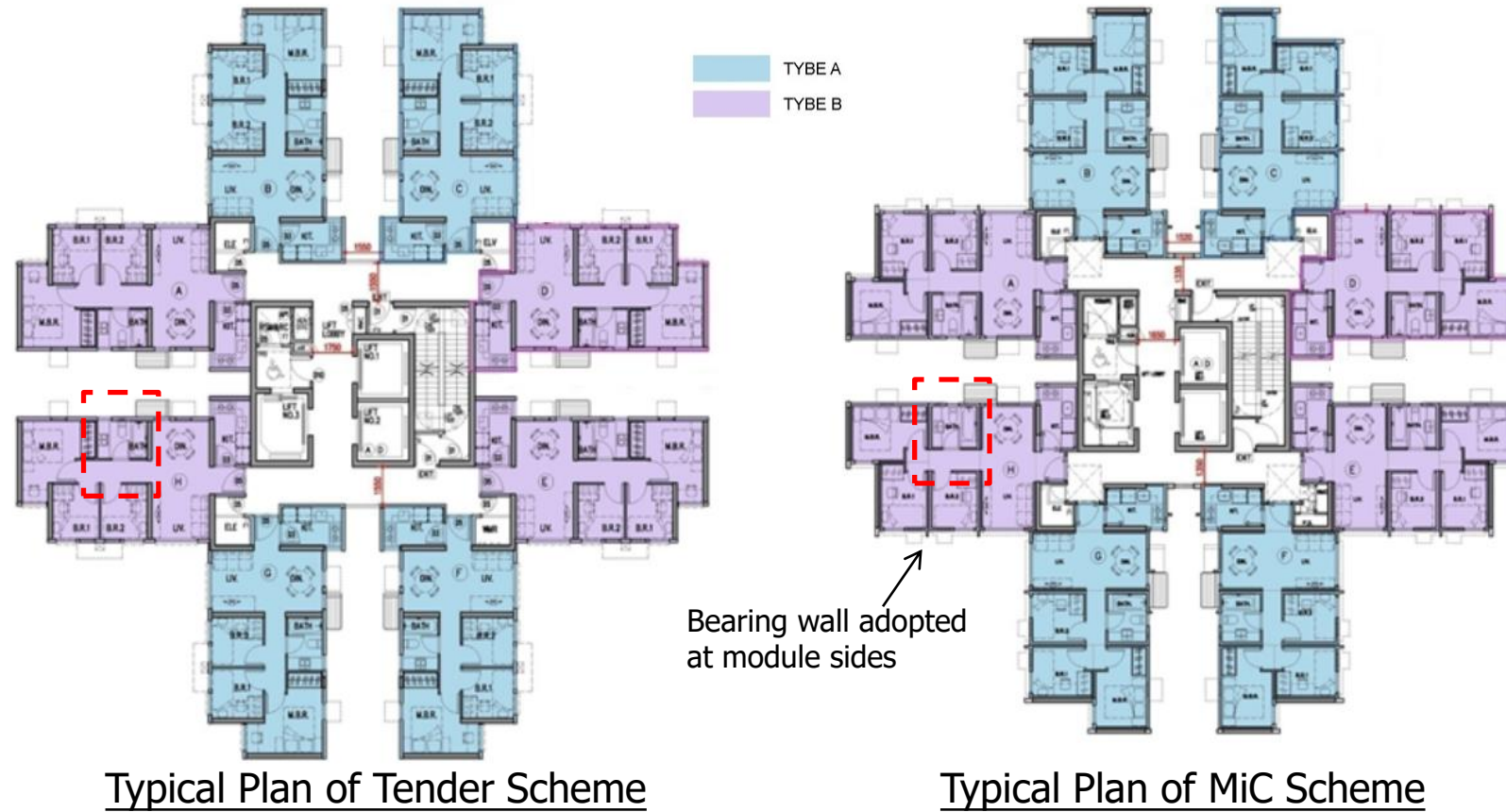


Concrete MiC Prototype No.1 (2019)



Project Team Inspection MiC Prototype No.2 (June 2019)

# Comparison of Tender Scheme and MiC Scheme(Typical Floor)



Typical Plan of Tender Scheme

Typical Plan of MiC Scheme

- Change of master bed room layout
- Additional beams to stiffen the MiC module
- Window size modified to suit layout

- Transfer plate provided as rigid base to prevent excessive deflection
- Height limit kept for 52m from finished ground level

## MIC Arrangement for Typical Floor Plan



End Wall : 8 Module x 81 Floor  
= 648 Modules

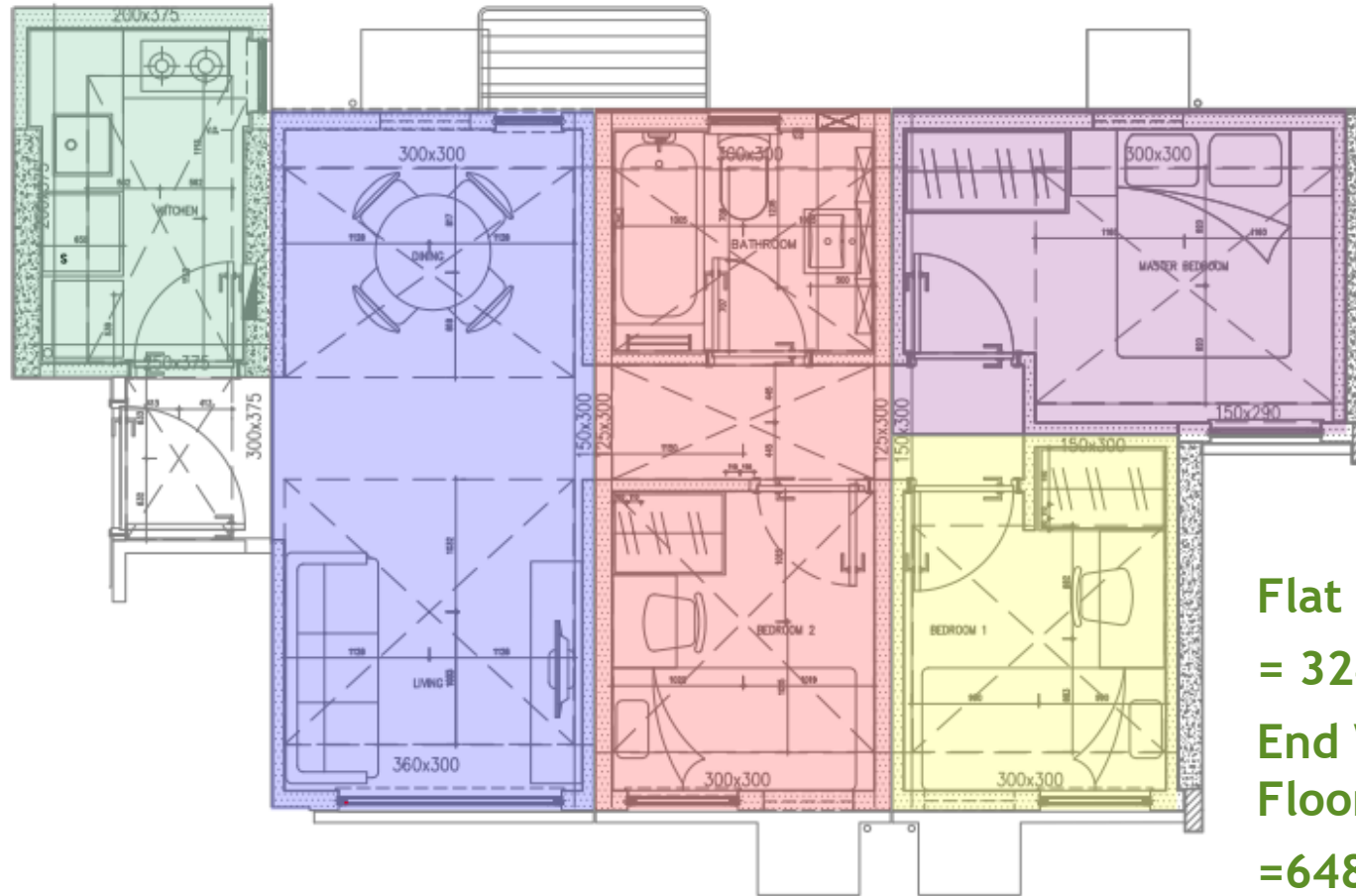
Flat : 5 Module x 648 Flat  
= 3240 Module

Plant Room: 6 Module x 81 Flat  
= 486 Module

Total = 4374 Module.



## MiC Arrangement for Flat Layout Plan



Flat : 5 Module x 648 Flat  
= 3240 Module  
End Wall : 8 Module x 81  
Floor  
=648 Module



## Statutory Inspection Requirements for Building Services Installation in MiC



## GUIDELINES ON THE STATUTORY REQUIREMENTS FOR MODULAR INTEGRATED CONSTRUCTION PROJECTS

www.cic.hk

September 2019

## Construction Industry Council

# Guideline on Statutory Requirements for Modular Integrated Construction in Hong Kong

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## Statutory Requirements in MEP related in MiC

Trade	Statutory Compliance
Plumbing	WSD Circular Letter No. 2/2019 dated 20/2/2019
Drainage	BD PNAP ADV-36 “Modular Integrated Construction” for Quality Control and Supervisor of MiC and Associated Test
Sanitary Fittings	BD PNAP ADV-36 “Modular Integrated Construction” for Quality Control and Supervisor of MiC and Associated Test
Electrical Services	EMSD Guidance Note on Fixed Electrical Installations with Modular Integrated Construction Method
Fire Services	FSD Circular Letter No. 3/2019 dated 22/3/2019 WSD Circular letter No. 2/2019 dated 20/2/2019

## Scope of MiC Modules in Factory

Structural Works	Architectural Works	BS Works
Steel mould installation	Waterproofing work	Metal trunking
Rebar fixing	Tiling work	Concealed conduit
Concreting	Painting	Wiring work
	Window installation	Sanitary fittings
	Door & ironmongery installation	Bonding Connection
	Cabinet & wardrobe installation	Cold & Hot Water Pipe and Town gas pipe sleeve inside bathroom and kitchen
	Curtain rail installation	External Pipe works at exterior walls (excluding riser pipe work)

### (Modules)

- Metal Trunking
- Concealed Conduit Installation
- Wiring Accessories
- Sanitary Fittings
- Bonding Connection
- Cold and Hot Water Pipe and Town gas Pipe Sleeve inside Bathroom and Kitchen
- External Pipe Works at Exterior Wall (Exclude Riser Pipe Work)



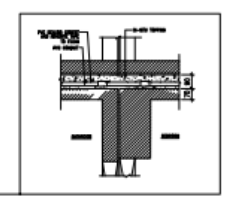
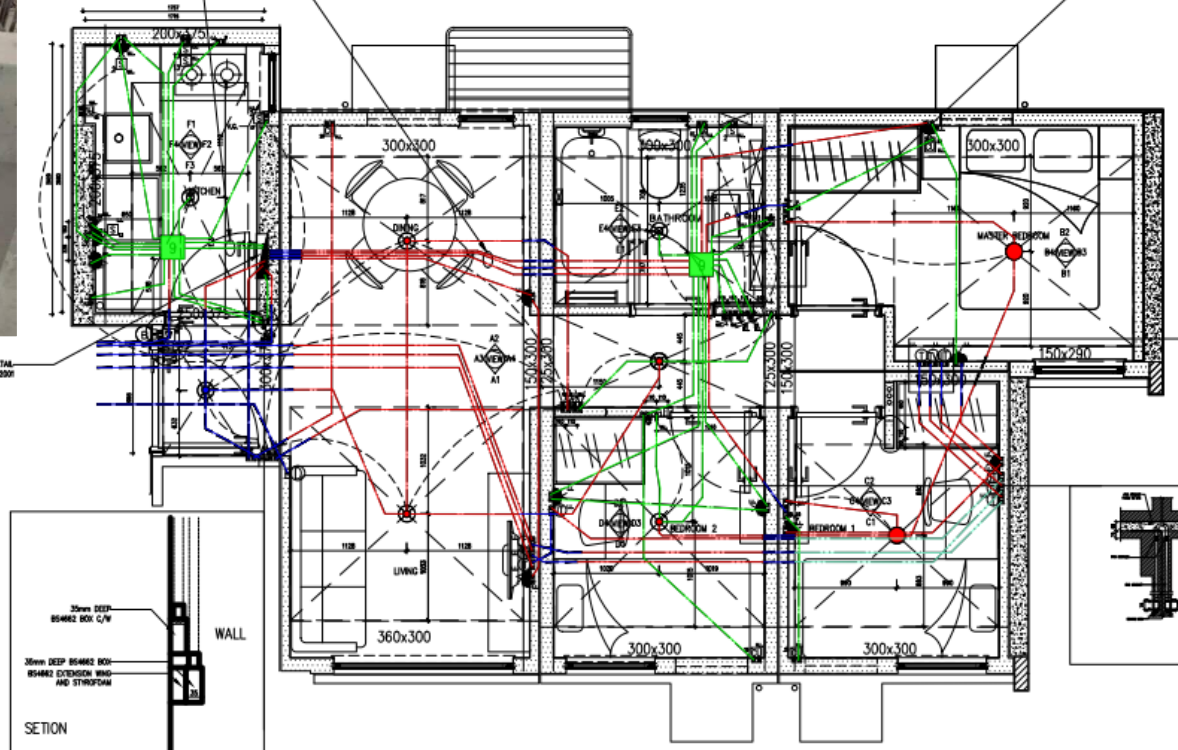
# Typical Flat (concealed conduits with wiring works)



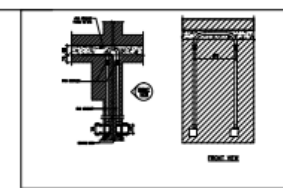
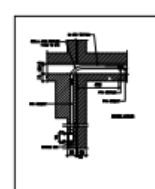
- Legend for Demarcation**
- Conduit connection works in HK
  - Completed Works in PRC for installation of
    1. Concealed Conduit of ceiling at the in-situ topping layer.
    2. Concealed Conduit and box of wall cast in MIC module.
    3. Wiring Accessories
  - Work in PRC for Installation of Concealed Conduit with Wiring Accessories Works in MIC.
  - Completed Works in PRC for installation of
    1. Concealed Conduit of ceiling at the in-situ topping layer.
    2. Concealed Conduit and box of wall cast in MIC module.
    3. Wiring Accessories
    4. Cable Wiring Works

3x1.5mm<sup>2</sup> 1/C CABLE  
12x4mm<sup>2</sup> 1/C CABLE  
6x2.5mm<sup>2</sup> 1/C CABLE

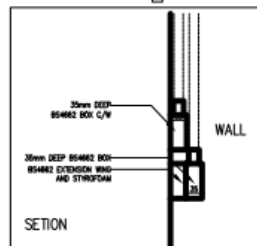
3x1.5mm<sup>2</sup> 1/C CABLE  
6x2.5mm<sup>2</sup> 1/C CABLE  
3x6mm<sup>2</sup> 1/C CABLE  
2x10mm<sup>2</sup> 1/C CABLE



LEGEND FOR CONDUIT



MIC BOARD INSTALLATION DETAIL REFER TO YL/SK2002/06/01.001



SECTION

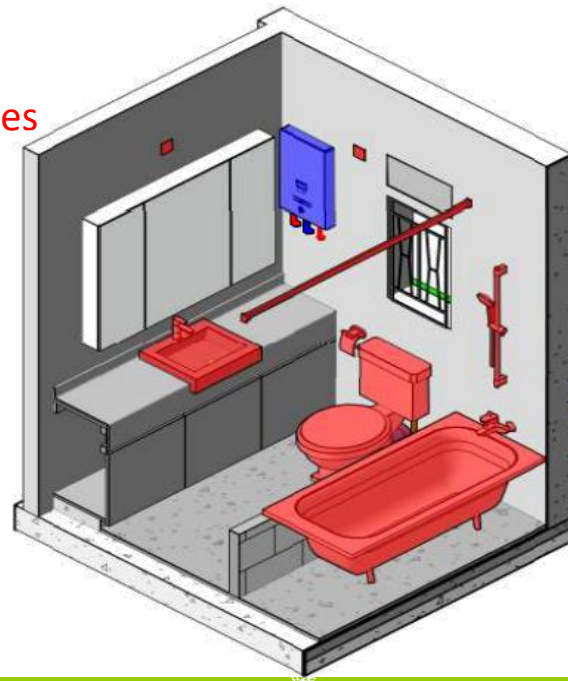
## Works in PRC

### EL.

1. Concealed Conduit
2. Wiring Accessories

### PD.

1. Sanitary Fittings (Wash Basin, Bath Tube, Water Closet and Ancillaries, etc)
2. Potable and Flushing Pipes
3. Drainage Pipes
4. Vertical Grating



## Works in HK

1. Towngas Heater (TBC)
2. Towngas Pipe

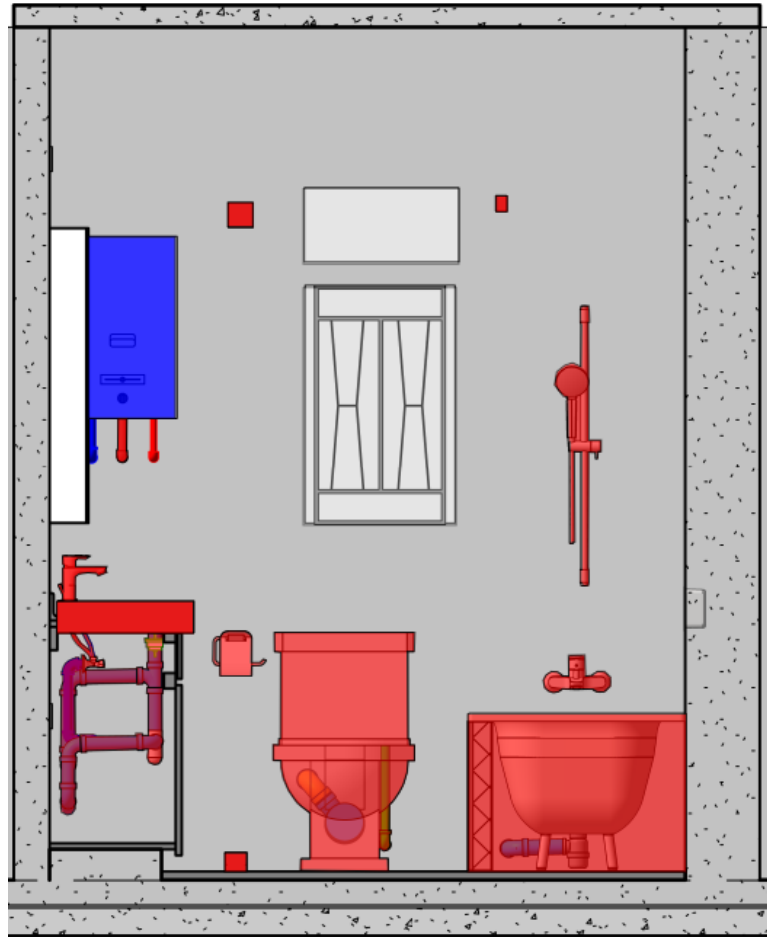




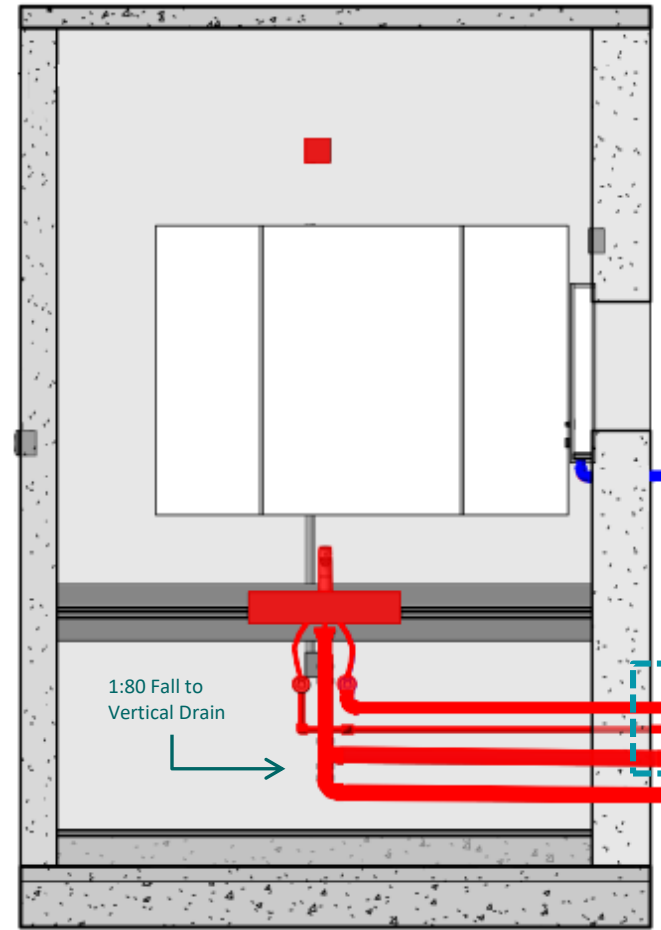
Works in PRC



Works in HK



Elevation a-a



Pipes Extend 50mm at External Area for Future Connection at Site



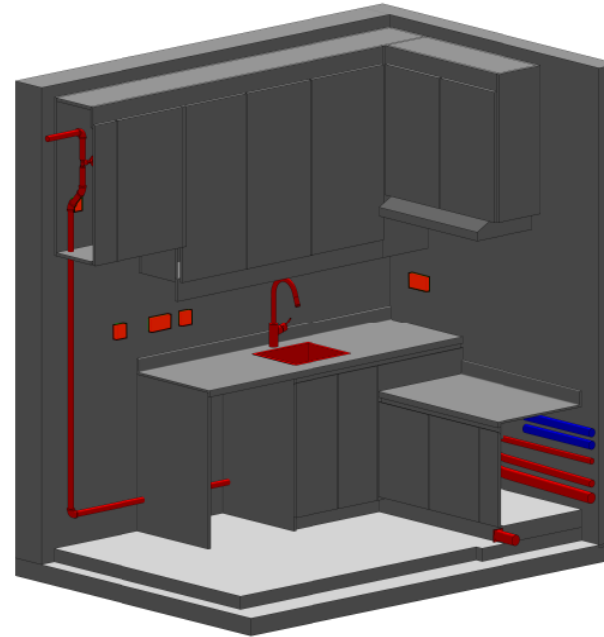
## Works in PRC

### EL

1. MCB Board
2. Wiring Cable
3. Wiring Accessories
4. Equipotential Bonding
5. Concealed Conduit

### PD

1. Sink
2. Water tap for Washing Machine
3. Potable Water Pipes
4. Drainage Pipes
5. Vertical Grating



## Works in HK

1. Towngas Pipe
2. Towngas Meter
3. Instantaneous Electric Water Heater

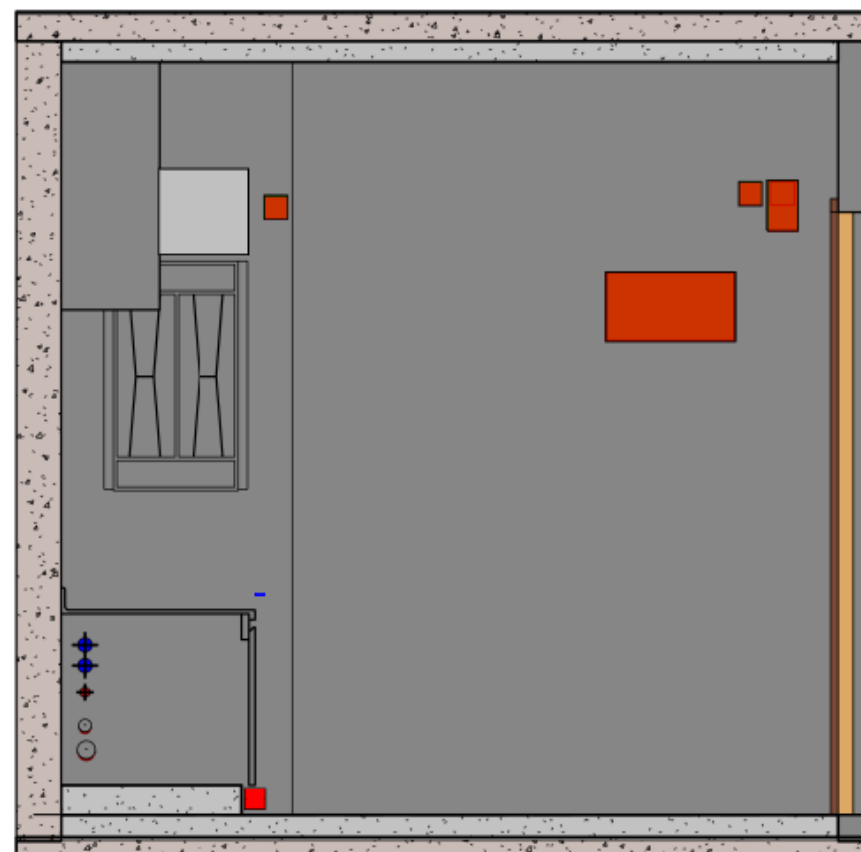
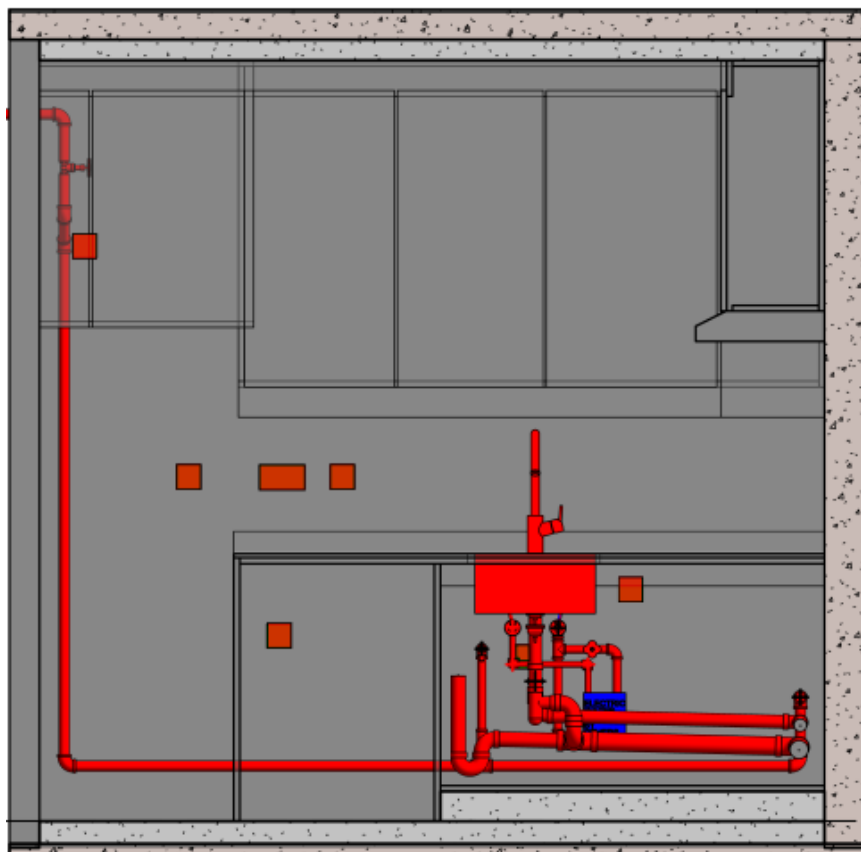




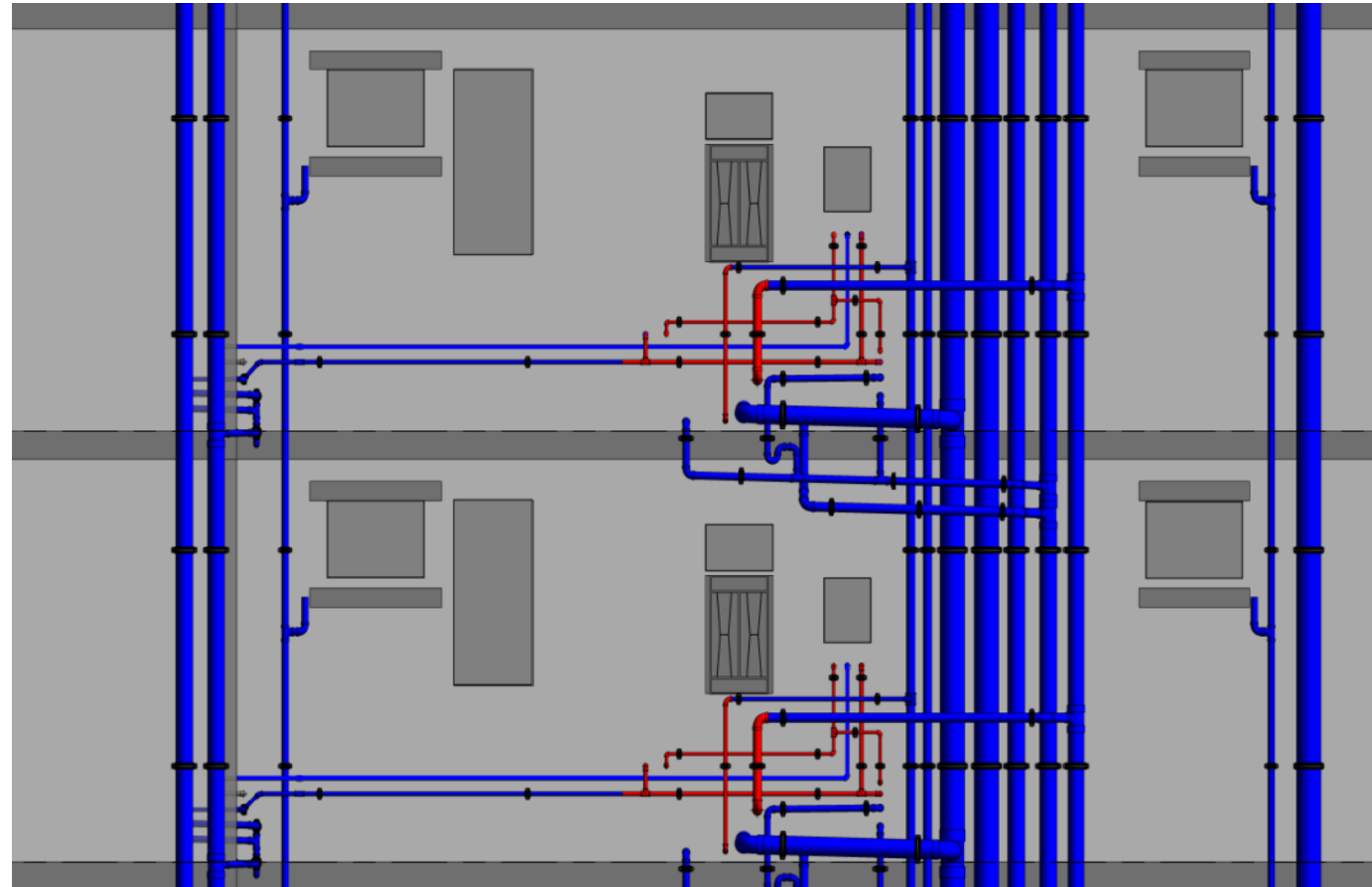
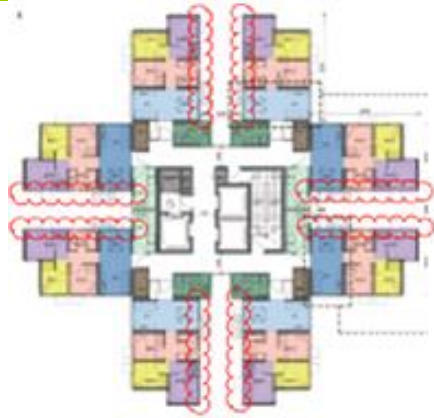
Works in **PRC**



Works in **HK**



# External Pipe works at exterior walls



 Works in PRC

PD.

1. Copper Pipe & Fittings
2. Potable Water Pipes & Fittings
3. Drainage Pipes & Fittings

 Works in HK

PD.

1. Riser Water Pipe & Fittings



 Works in PRC

EL

1. Concealed Conduit

PD

1. Pipe Support

2. Copper Pipe & Fittings

3. Valves

 Works in HK

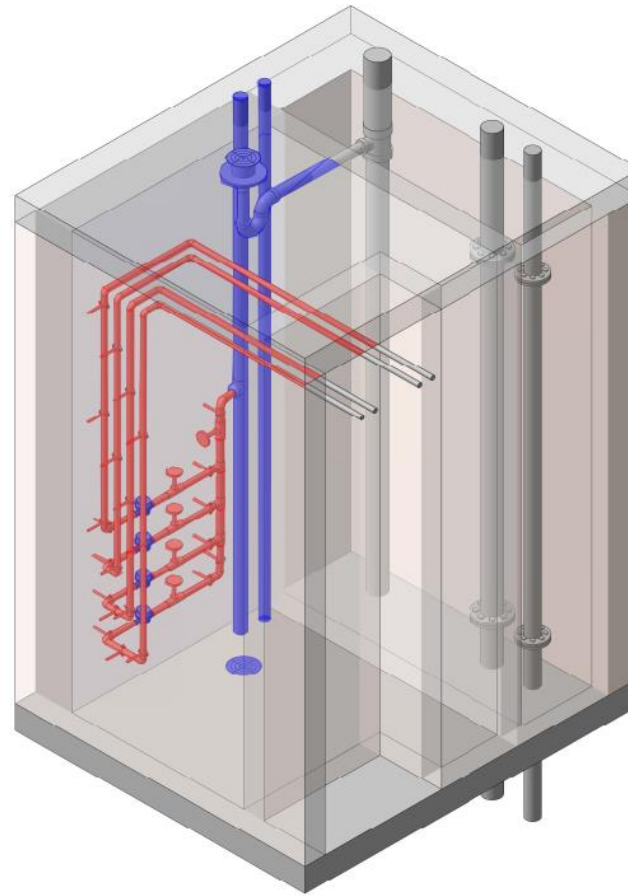
PL

1. Water Meter

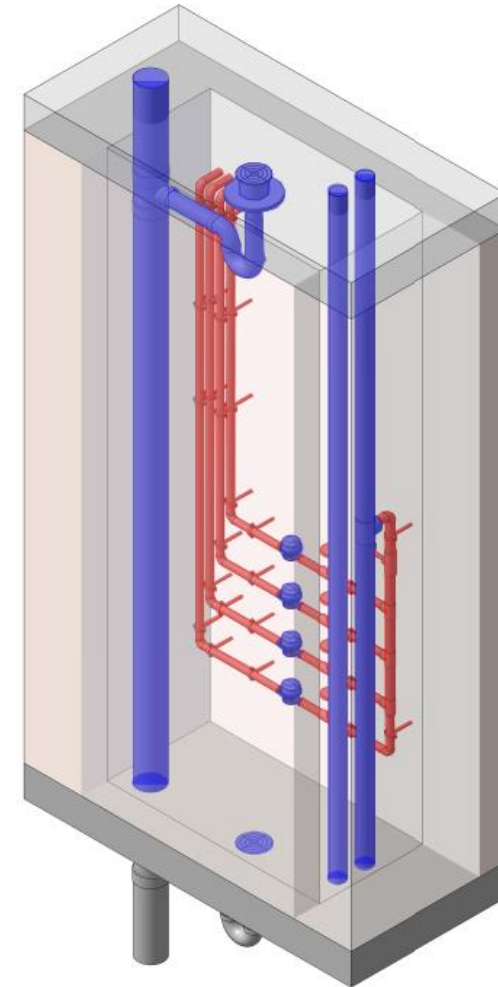
2. Floor Drain

3. Waste Stack

4. Potable Water Riser



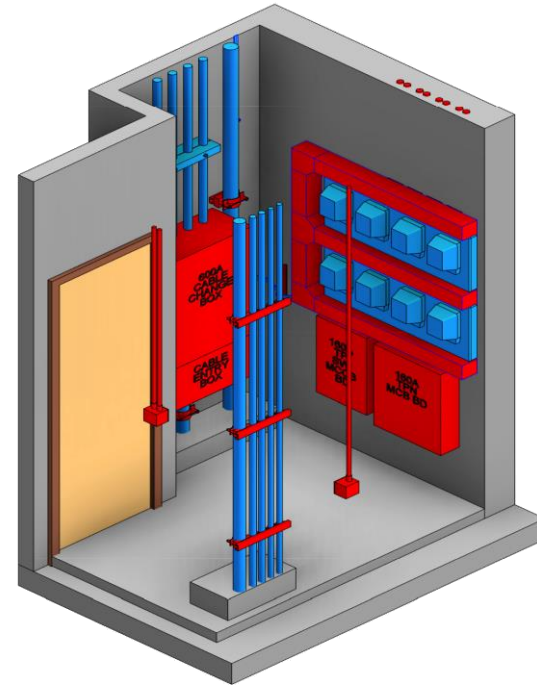
WMC Type A



WMC Type B

## Works in PRC

1. Metal Trunking
2. MCB & MCCB Board
3. Concealed Conduit
4. Cable Cleat
5. Tape Saddle
6. Concealed Conduit



## Works in HK

1. Cables
2. Earth Tape
3. Upper Portion of Trunking
4. CLP Meter
5. Meter Board



# Electrical Room & ELV Room

 Works in PRC

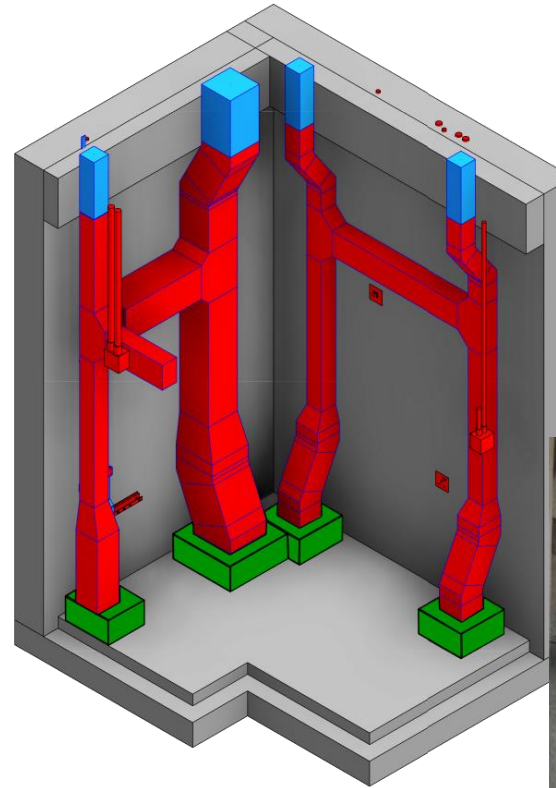
1. Trunking
2. Concealed Conduit
3. U-Channel
4. Tape Saddle

 Works in HK

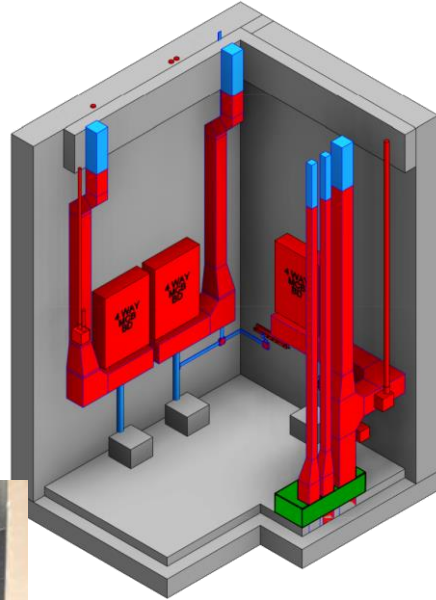
1. Cables
2. Earth Tape

 Work In PRC

1. Curb works by Builder



ELV Room



Electrical Room

# Large Production Area

- Extremely space intensive
- 14 production lines for this Project
- Around 29,500 sq.metre, 35% of precast production area. Possible increase to 50%







Array of MiC modules



Work in MiC Modules

## Delivery to Site and Hoisting

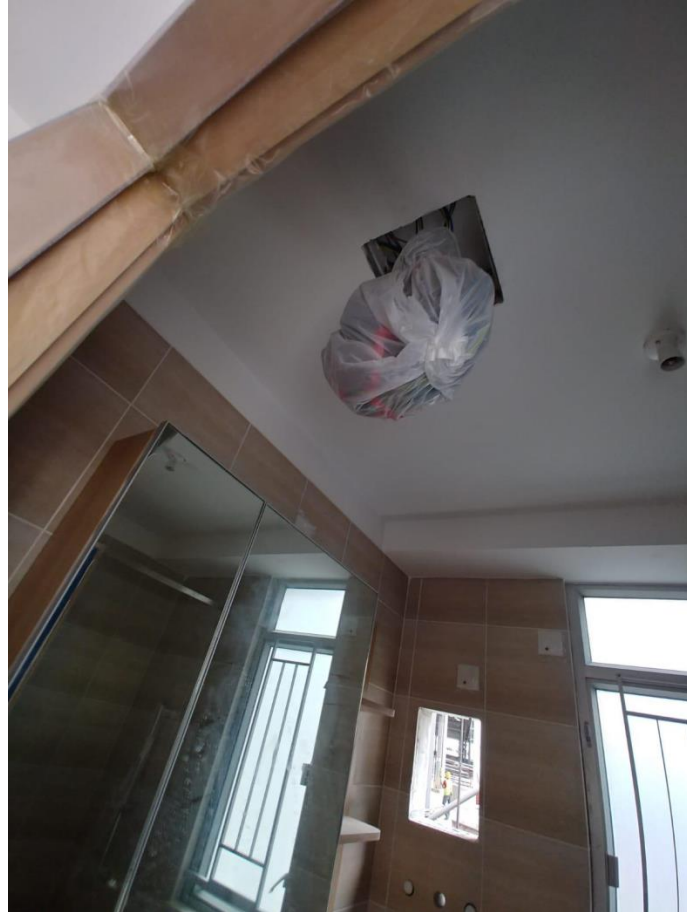


## Beauty : Quality of Work - setting out





## Beauty : Environmental - reduce wastage





## Beauty : Labour Efficiency - reduce idling time



Beauty :  
Safety - reduce potential risk



## the Beast -

- Early engagement of specialist contractor
- Early frozen of design
- Early definition of scope of work in factory and on site
- Early submission and approval - statutory
- Early submission and approval - drawing and material
- Material logistic - in and out of border
- On site Hoisting - beware the limitation of tower crane
- Cost concern - current progress payment method is not favourable
- and more.....

However, Permanent Secretary of Development (Works)

Ir S H Lam JP was quoted :

**“裝備第一 機不可失”**

**We Build    We Serve    We Create**  
**We BIM                      We MiMEP**

盈電網址  
REC's Website  
[www.rec-eng.com](http://www.rec-eng.com)

多謝

*Thank You!*