HKFEMC
香港機電工程商聯會

MiMEP Design

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Introduction

What is MiC?

Modular-Integrated Construction

What is DfMA?

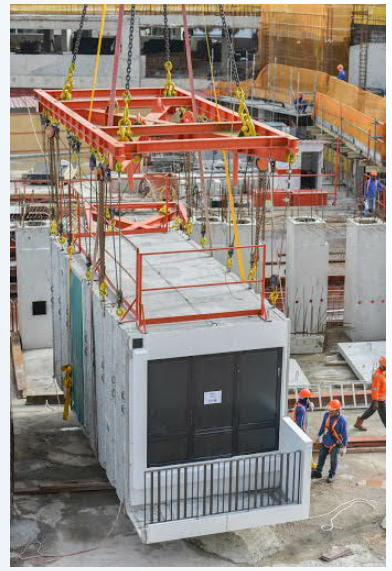
Design for Manufacturing & Assembly

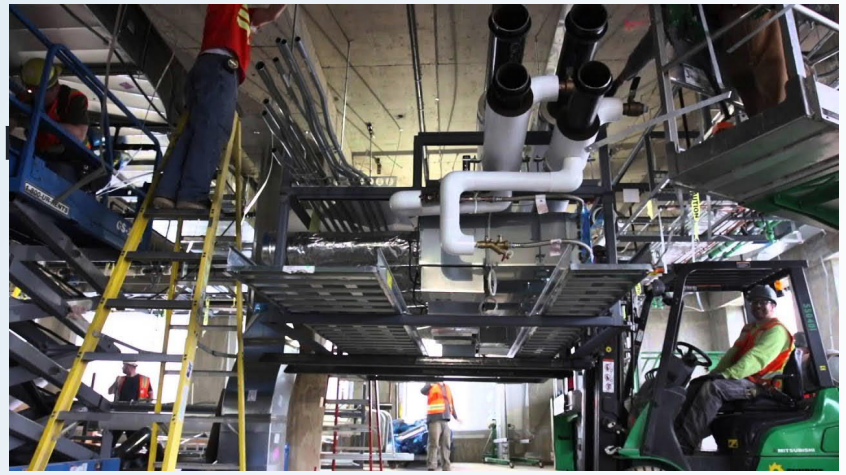
What is PPVC?

Prefabricated Prefinished Volumetric Co

What is MTP?

Multi-Trade Prefabrication





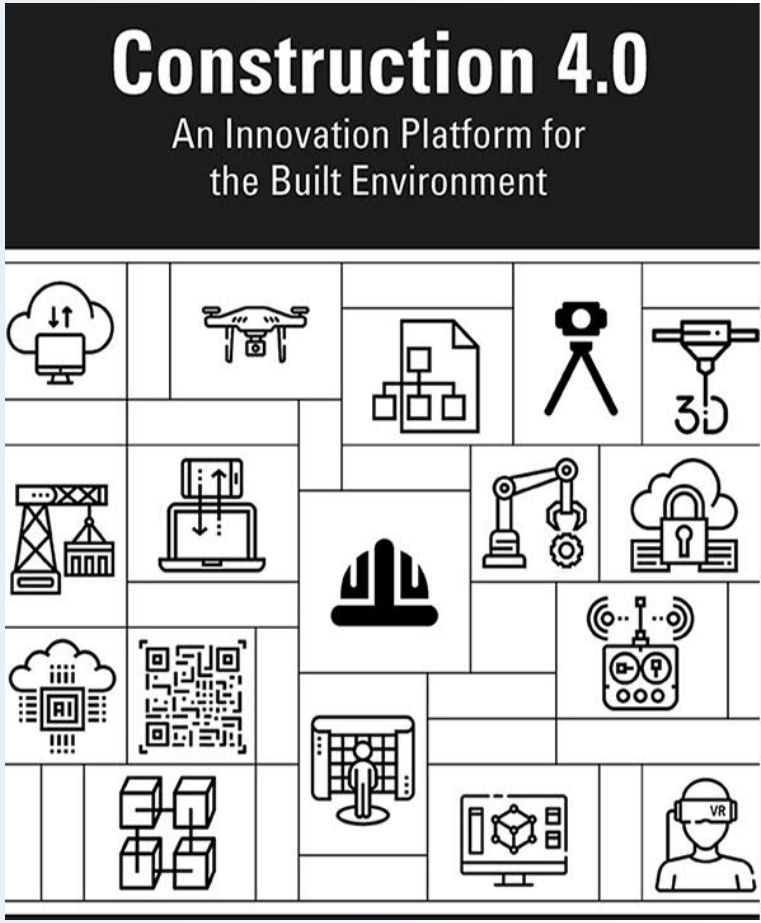
What is MiMEP?

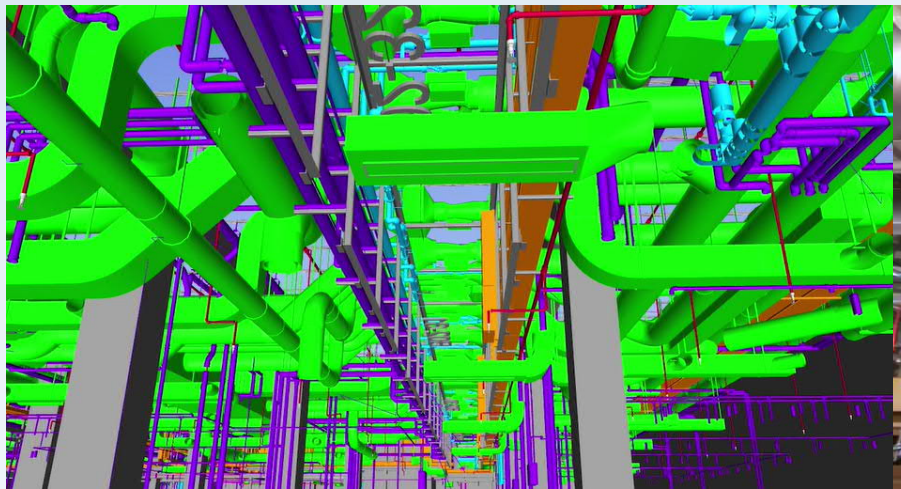
MultiTrade Integrated Mechanical, Electrical & Plumbing

MEP components and equipment integrated into a sub-assembly off-site and then deliver to and installed on site.

Why MiMEP

- Shortage of skilled labour & aged construction workers
- Congested services within limited MEP space, plantrooms, headroom
- Uncoordinated services and installation sequencing
- Industrialized Construction, Construction 4.0 & Digitalization
- Adoption & acceptance of BIM

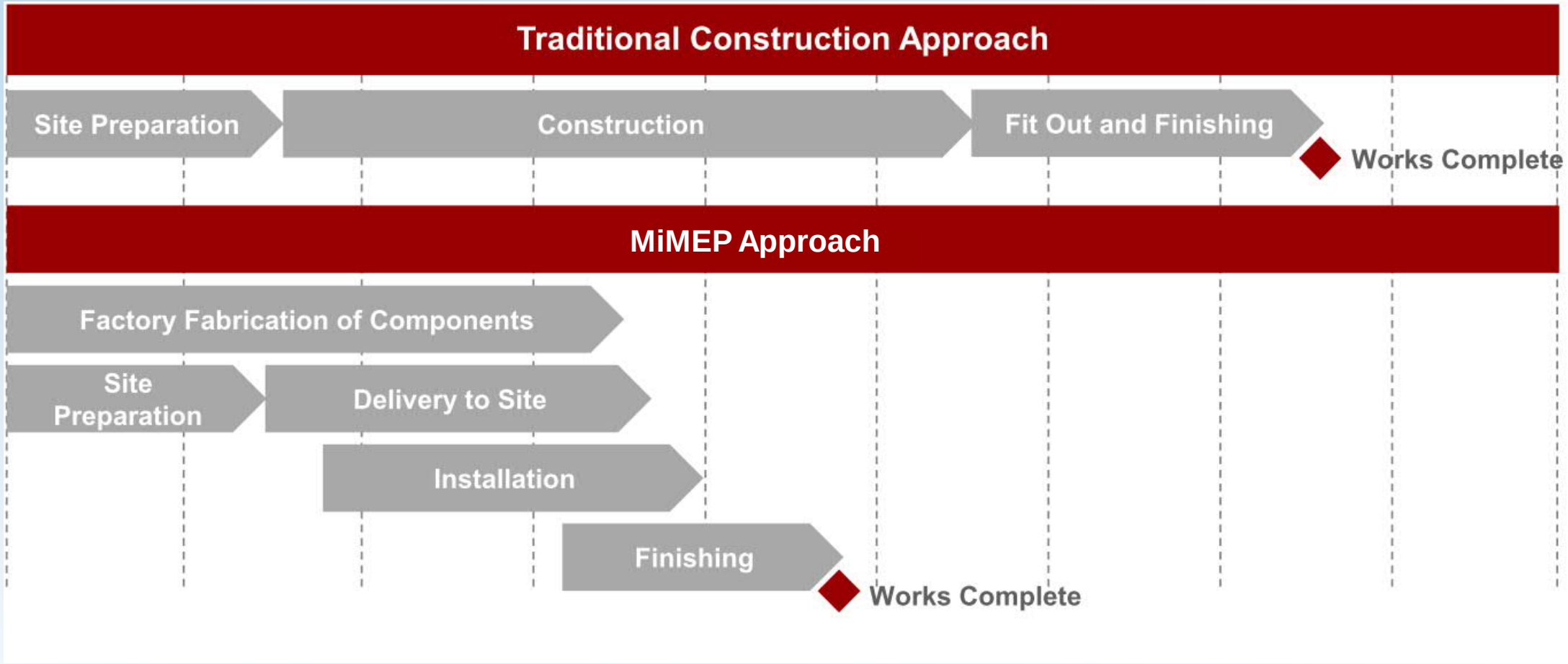




Benefits

- Savings in construction time
- Less on site manpower as majority fabrication & assembly process completed off-site and reduces labour intensive site works
- Concurrent on-site & off-site construction and fabrication
- Higher consistency in quality by using precision & automatic machineries & quality assurance of MEP works in 360 degree access on the assemblies under controlled factory fabrication environment
- Minimize labour intensive works at height & enhance site safety
- Reduce noise, dust pollution, hot works & construction waste
- Reduce material wastage with neatly construction site
- Reduce abortive works with earlier identification of conflicts

Benefits


Traditional Construction Approach
Site Preparation
Construction
Fit Out and Finishing
Works Complete
MiMEP Approach
Factory Fabrication of Components
Site Preparation
Delivery to Site
Installation
Finishing
Works Complete

Design Considerations

- Project driven to construction & assembly driven
- Modularity, high repetition with low variations
- Statutory compliance
- Building compartmentation & joints
- Room dimensions, columns, core walls, cross bracing
- Construction access and left-out

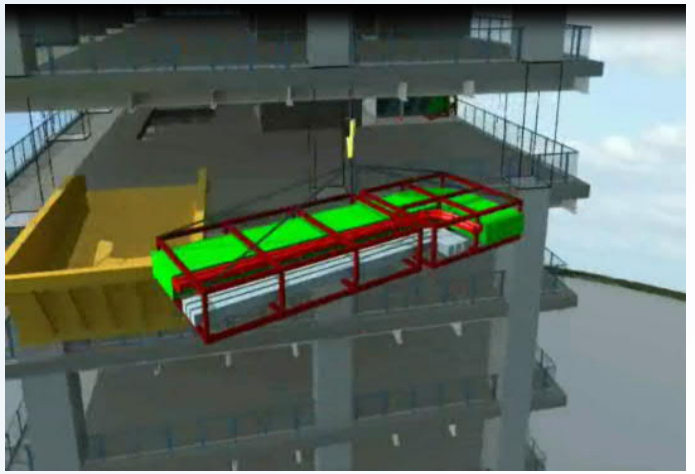
MEP corridor racks being delivered to the jobsite

MEP corridor racks being lifted to the floors

A tower crane lifting the MEP corridor racks

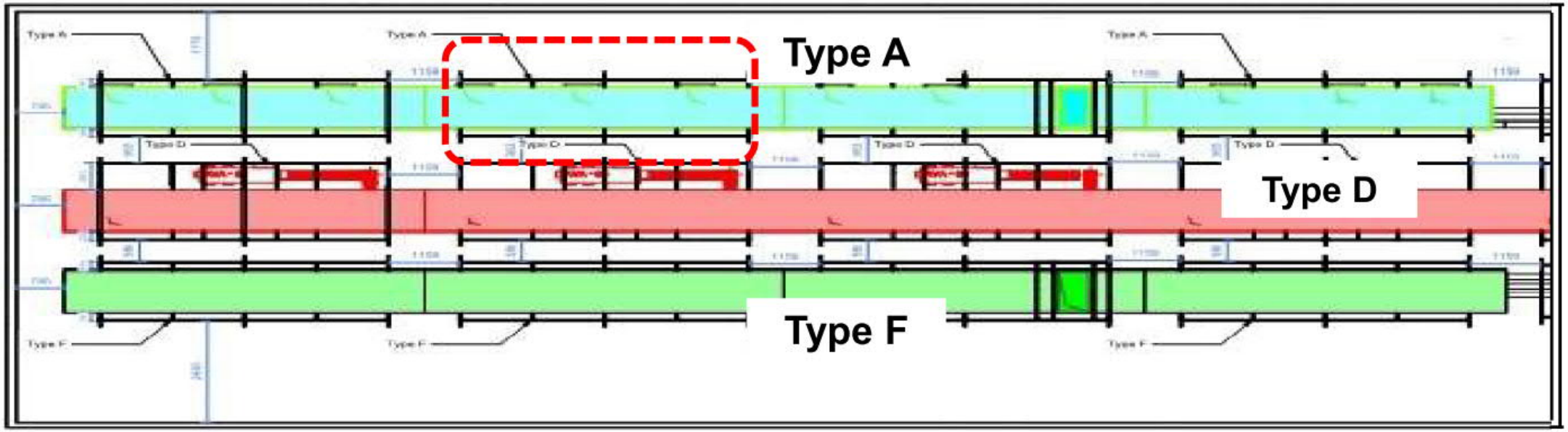
Design Considerations

- Vertical and horizontal connections
- Alignment of MEP services compensation
- Large assemblies
- Transportation from factory to site and to place
- Structural rigidity for module handling, lifting points for hoisting, supporting frameworks dimensions & weights
- Site construction tolerance & installation allowance
- Structural connection between modules & with in-situ

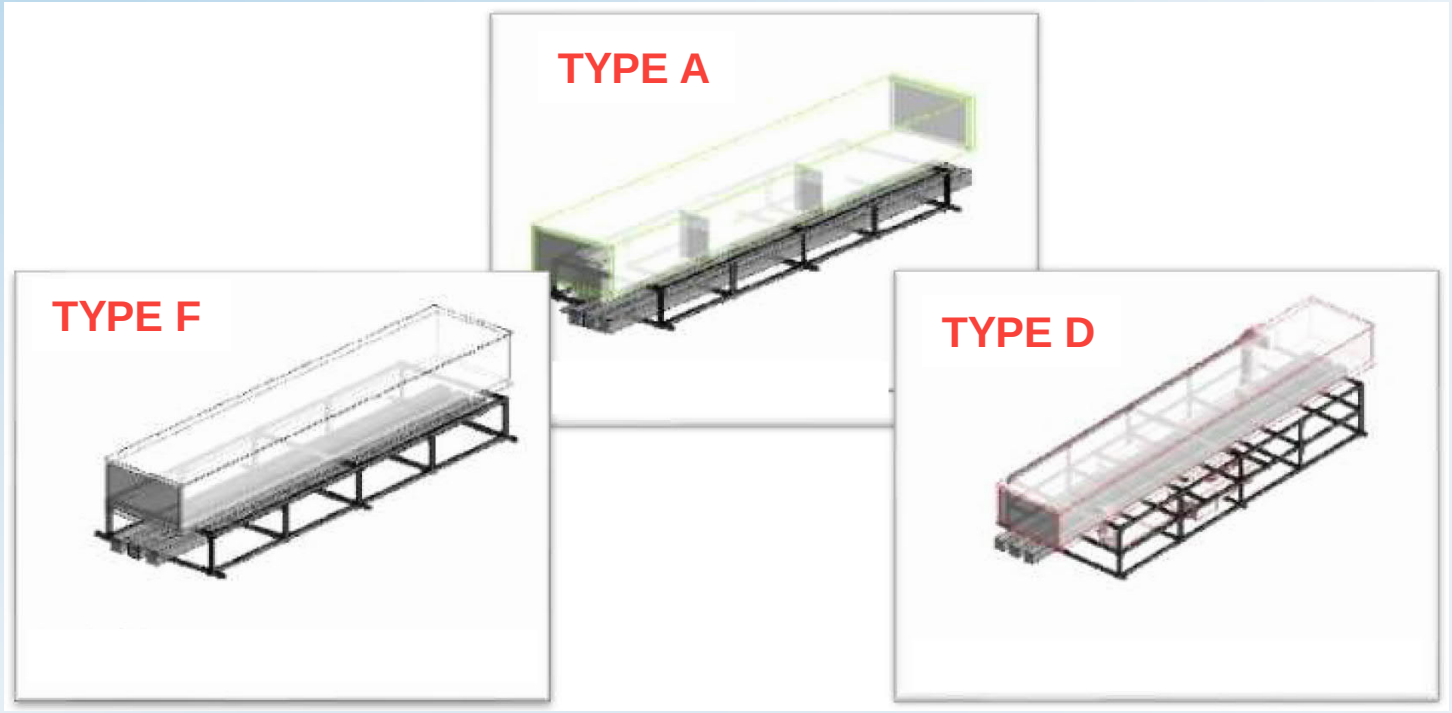


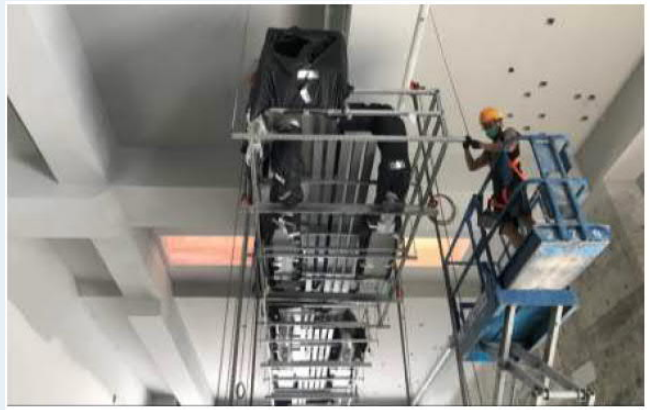
Design Considerations

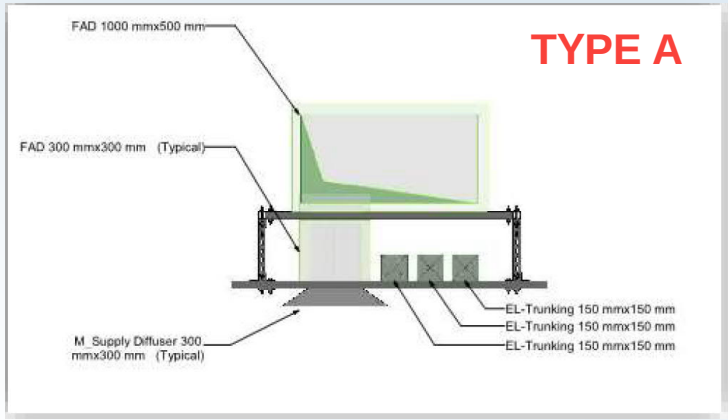
BS services included	Electrical and ELV trunkings, AC ductwork and VAV boxes
Location	3F Training Workshop (40 x 10.5m)
Module Size	4.8m x 2.2m x 1.4m
No. of Modules	18
Types of Modules	3

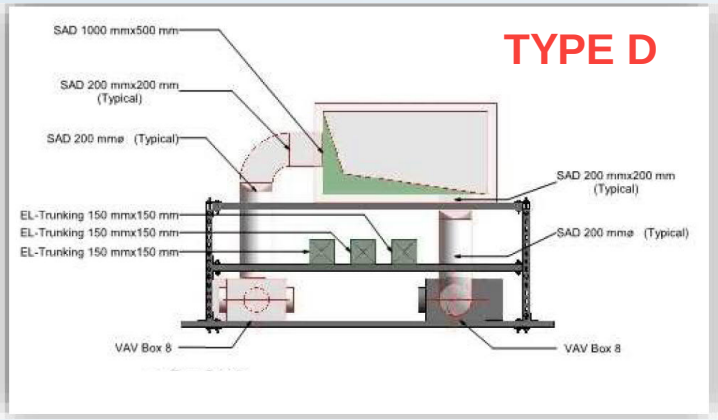


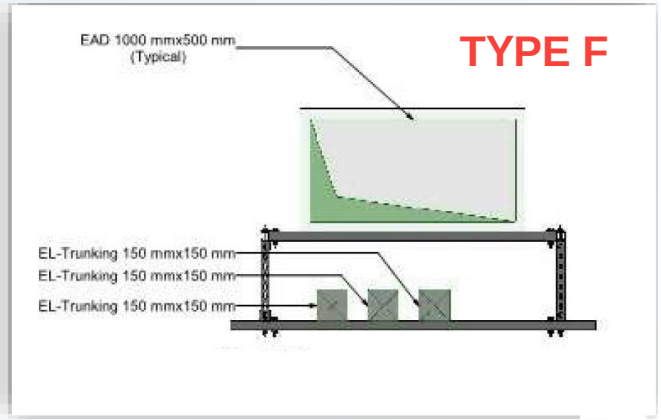
Design Considerations











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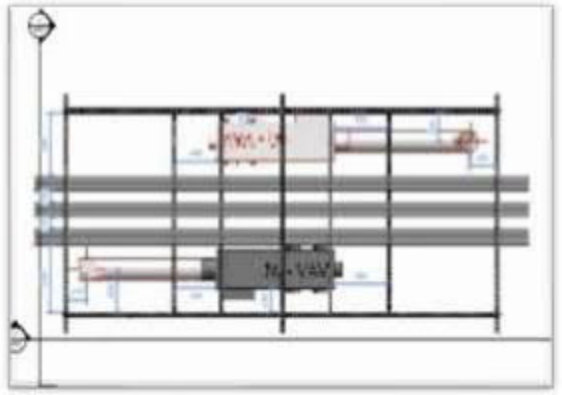


Design of Rack Module

Off-site Prefabrication

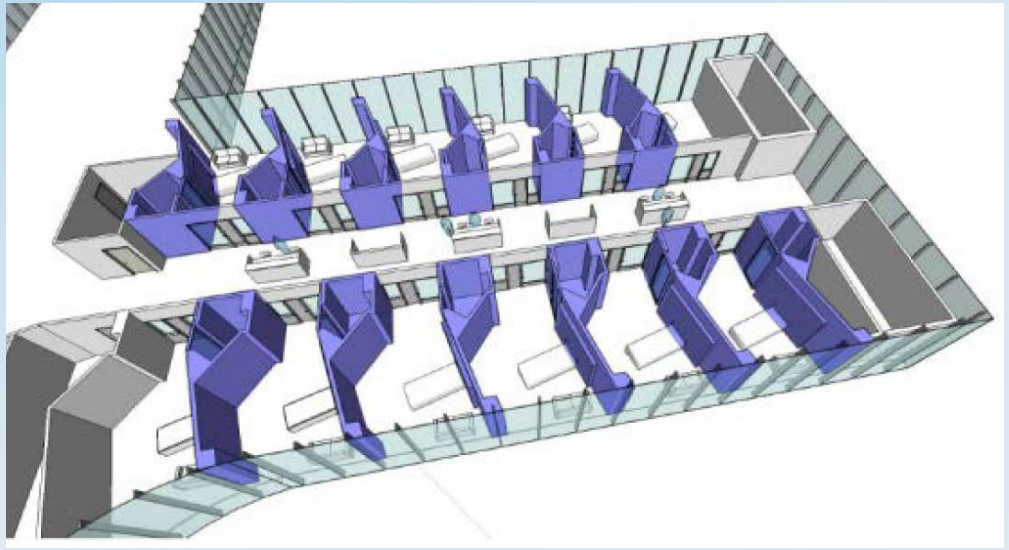
Delivery on-site by Lorry

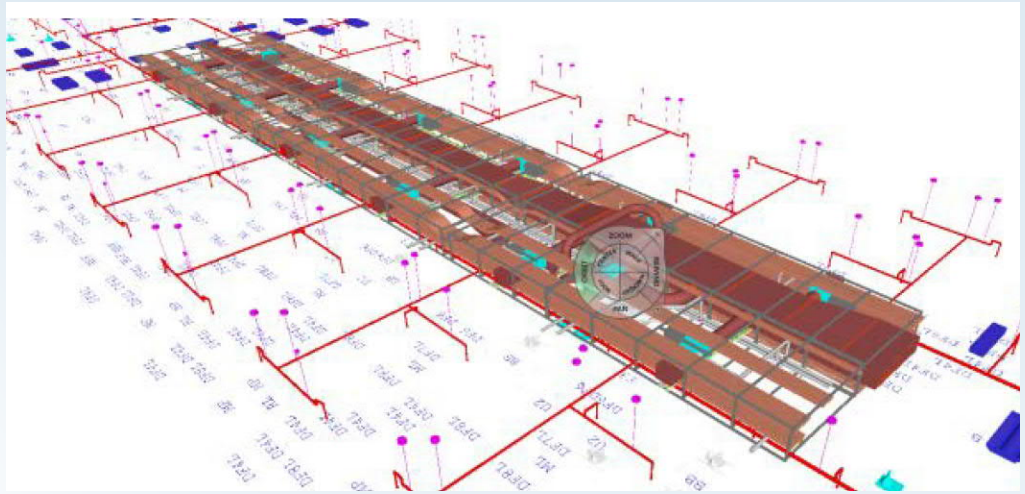
Ready for Installation

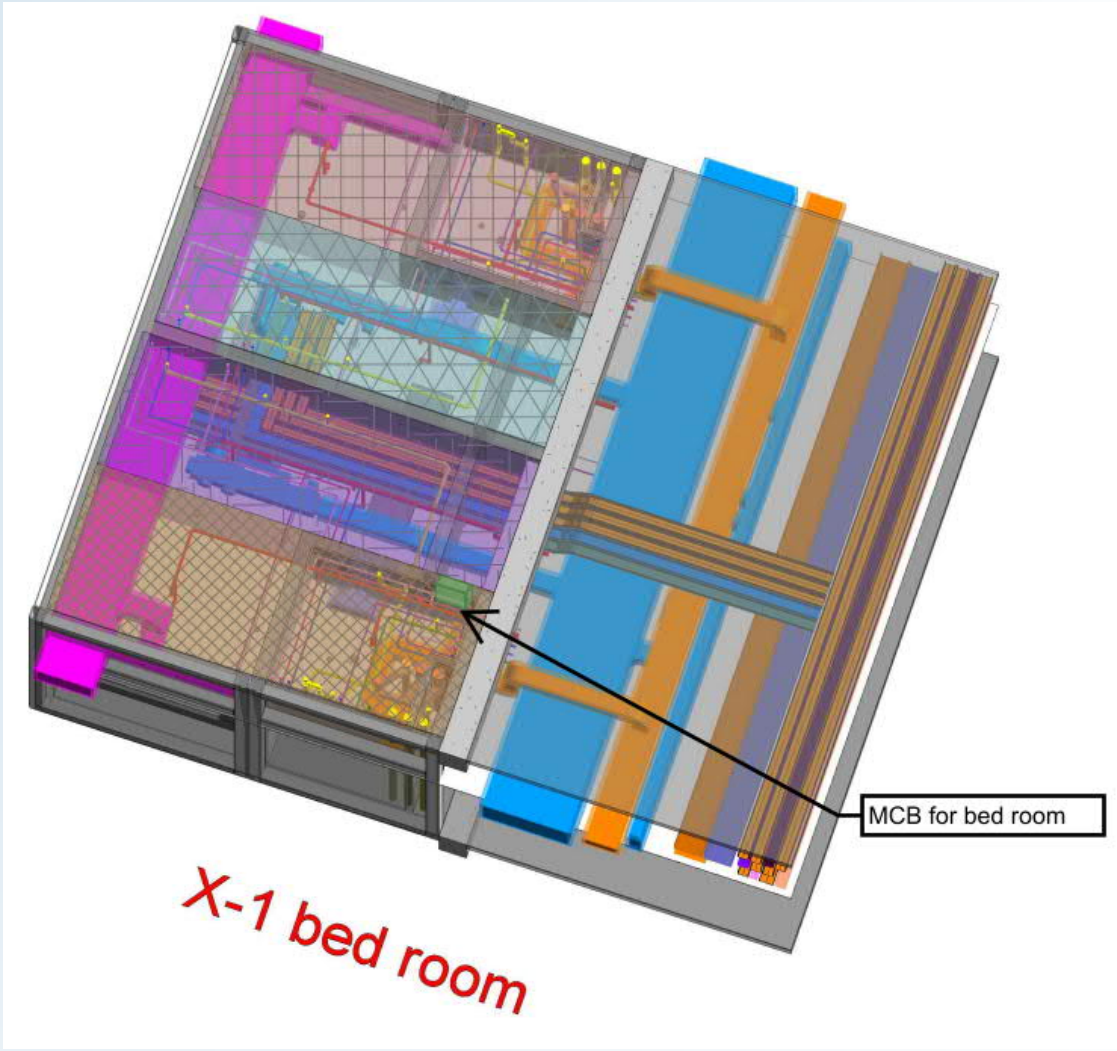
Design Considerations

- Size of each MiMEP 4.8m x 2.2m x 1.4m (LxWxH)
- Total 18 modules
- Reserving 1.2m jointing zone among modules
- Space to facilitate the lifting platform for installation
- Use of unistrut for minor lateral/vertical movement for alignment adjustment

Design Considerations







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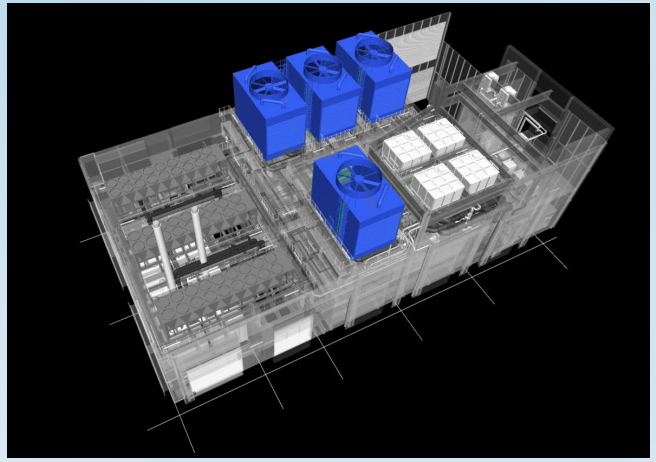
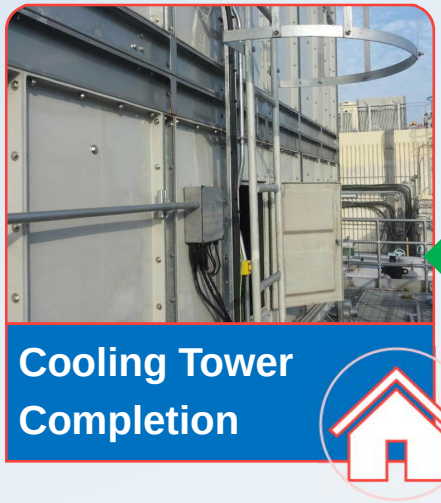


Off-site
Pre-Assembly

Module
Completion

Delivery of
Module to site

On-site Module
Assembly



Cooling Tower
Completion

Success Factors

- Clients ’ know what they want
- Open minded, accept of new technologies & innovations
- Early design decisions & finalization
- BIM for coordination & collaboration with virtual design & construction
- Supply chain management, planning with just-in-time approach for module installation – factory assembly, delivery, hoisting, installation & final connections
- Allowance of flexibility for mis-alignment
- Use of snap-fits, couplings & adhesive bonding rather than bolts & nuts, screw joints, etc. for final connections
- Competent integrated multi-trade MEP contractors
- Mindset change, partnership & early involvement with MEP contractors

MEP corridor racks BIM model design and final MEP corridor racks installed

Acknowledgement of Photos:

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