1. INNOVATIVE / PERFORMANCE ENHANCEMENT TECHNOLOGIES APPROVED FOR PREVIOUS NB PROJECTS

(*NB Jul 22*)

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Introduction

(1) These slides contain innovative / performance enhancement technologies that have been approved in previous BEAM Plus NB (New Buildings) projects.

(2) The approval years are given in brackets.

(3) Users are reminded that technologies approved as IA points for a past project do not necessarily mean that they would attain the same IA scores for other projects. Project assessment will take into account individual circumstances.

Introduction (cont'd)

Definitions of IA1 and IA2 under NB v1.2

- **Innovative Techniques (IA1)** – Advance practices and new techniques not yet been widely adopted in Hong Kong or even elsewhere with environmental benefit.
- **Performance Enhancements (IA2)** - Strategies and techniques perform sig. better than BEAM requirements.

Introduction (cont'd)

"IA" definition under NB V2.0

Present evidence of the application of new practices, technologies and/ or techniques that are

(1) not described in this manual;

(2) not market mainstream implementation; or

(3) multiple aspect achievement

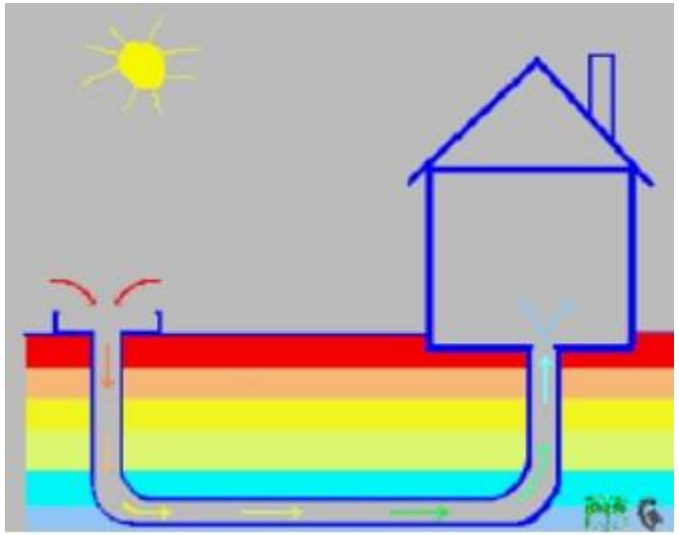
There is only IA1 in NB v2.0. No IA2 is present.

LIST OF PAST CASES

Innovations

An earth tube system has been installed to provide free cooling of fresh air supplied to the Entrance Lobby The earth tubes are installed approximately 2 m below ground, where the ground temperature is relatively constant throughout the year. The Applicant submitted catalogues, performance record, as-built drawings and site photos of the earth tube system. The performance record indicates that the earth tube system cooled outdoor air from 28 C to 23.6 C, a temperature reduction of 4.4 C.

(Approval Year: 2014)

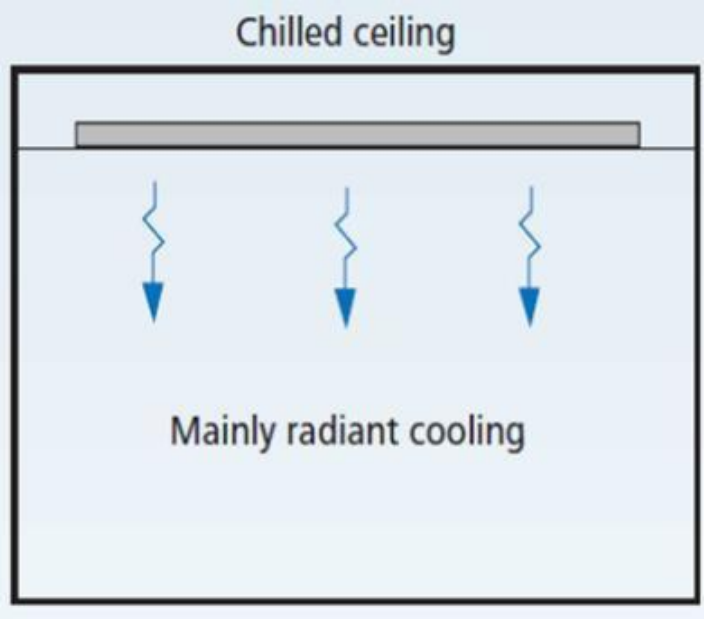


Innovations

The chilled ceiling system shall be adopted on 1/F office about 1000sq.m. The Applicant submitted the environmental performance report for chilled ceiling with estimated about 20,000 kWh electricity saving.

(Approval Year: 2018)

Chilled Ceiling



Innovations

The Applicant submitted catalogues, performance records, as-built drawings and site photos showing passive chilled beams installed in 2 Discussion Rooms inside the Library The performance records indicates that the room temperature achieved in Discussion Room 1 and 2 are 23.5-24 C and 24-24.5 C respectively.

(Approval Year: 2014)

Innovations

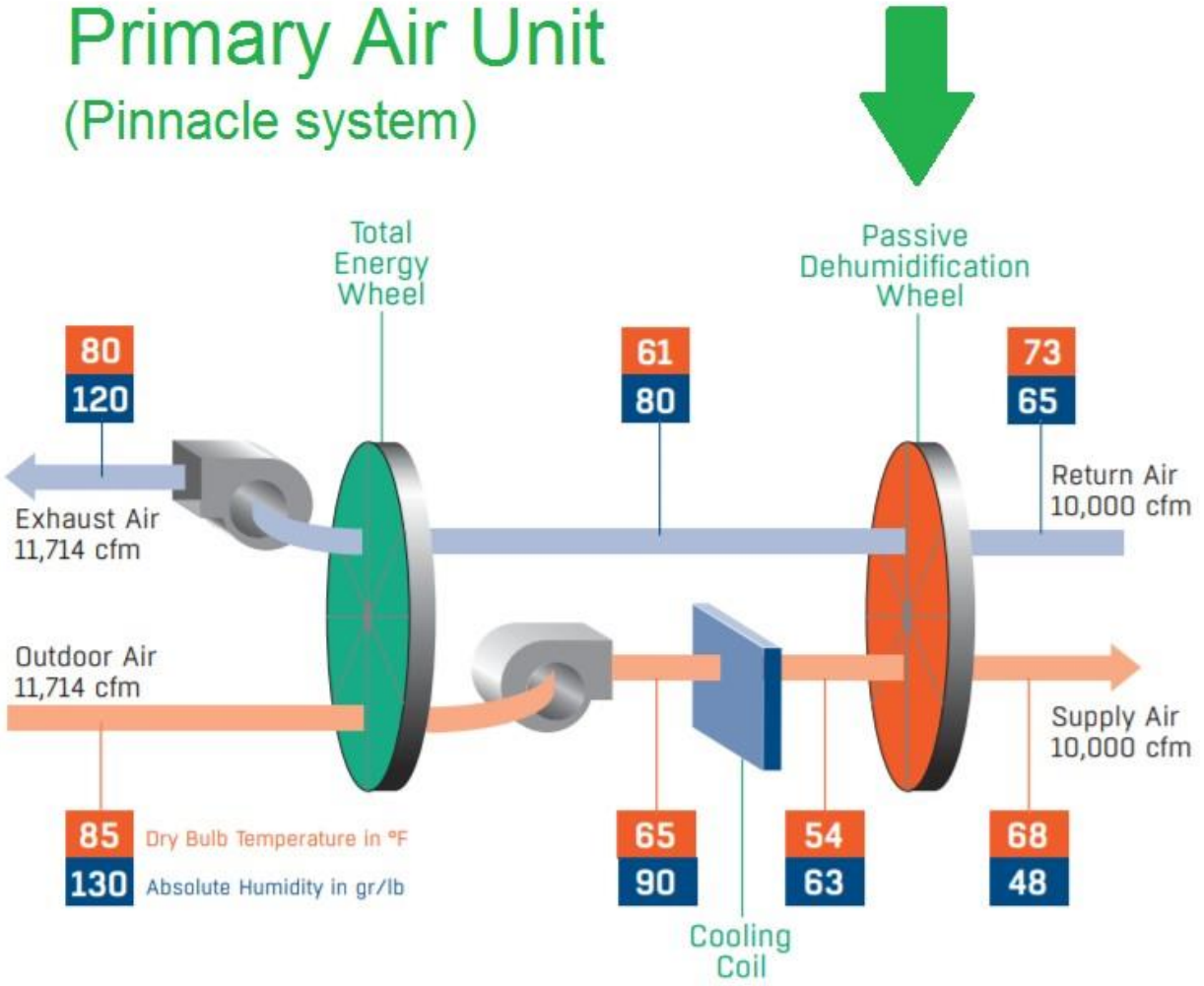
"decoupling" building latent loads from sensible loads through the use of dedicated outdoor air systems as well as chilled beams

This is possible if the outdoor air volume provided to the system is dehumidified enough to handle both the outdoor air and space latent loads.

The Pinnacle system has more latent capacity and higher energy efficiency than a desiccant-based cooling (DBC) or a dual-wheel energy recovery system (DWERS.)

development of a new class of product, the passive dehumidification wheel. This wheel uses a desiccant material that is optimized to remove moisture from a saturated air stream without an active regeneration source.

(Approval Year: 2014)

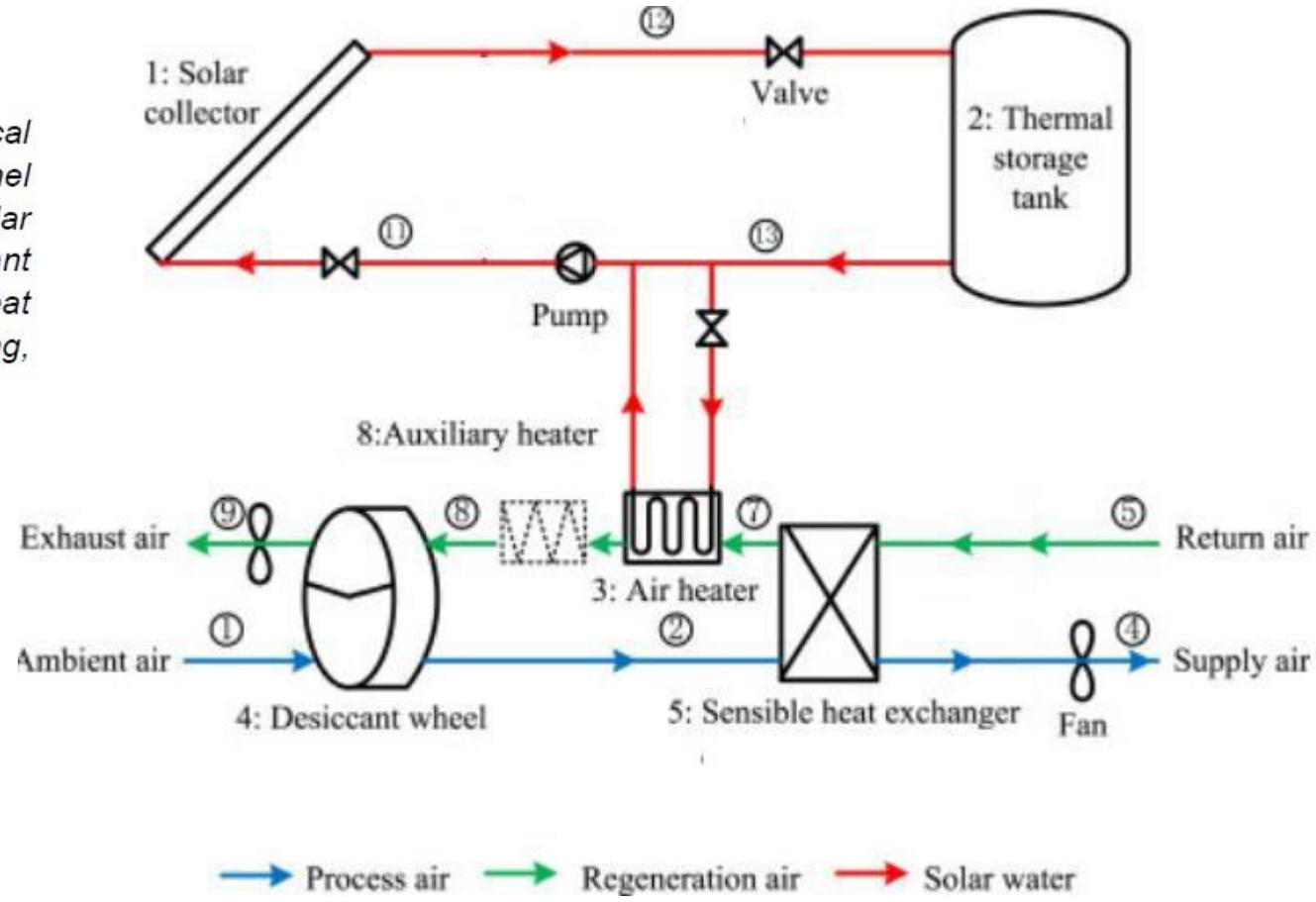


Innovations

Solar desiccant dehumidification

The Applicant submitted MVAC schematic diagrams & layout plans, technical specifications of the proposed renewable energy installations (i.e. solar panel and thermal wheel), equipment schedules, catalogues and solar regeneration power calculation to demonstrate the solar desiccant dehumidification is an integrated system with desiccant wheel and heat recovery wheel in the PAU system, which resulted in higher energy saving, better thermal comfort and IAQ level.

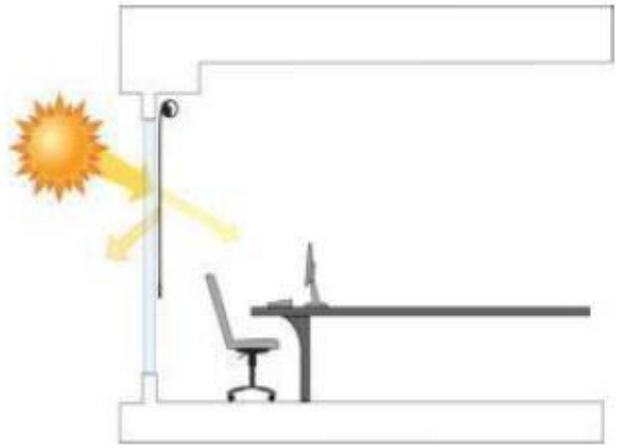
(Approval Year: 2019)

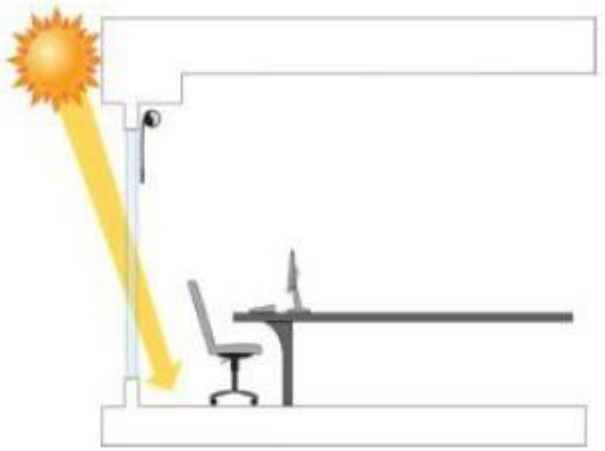


Innovations

The Applicant submitted information of the Daylighting autonomy system combing the daylight sensor, automated shades, management hub and automated lighting in perimeter zones to control glare and reduction of lighting consumption.

(Approval Year: 2018)





Innovations

The Applicant proposed the Modular Integrated Construction (MiC) referring to a construction method whereby free-standing volumetric modules (with finishes, fixtures, fittings. etc.) are manufactured off-site and then transported for construction buildings. The narrative and drawing on Modular Integrated Construction (MiC) demonstrated which will be incorporated into the project building design. The benefits are as follows: 1) Less demand on-site labour, 2) Improve site safety, 3) Shorten construction period, 4) Less construction waste, 5) Reduce noise and dust pollution and 6) High consistency in quality of works

(Approval Year: 2019)

MiC

IA1- Innovative Techniques

Utilise waste cooking oil / grease trap waste

- *Bio-diesel is supplied by 3 numbers of local plants locating in Tseung Kwan O and Lung Ku Tan, Tuen Mun.*
- *Local suppliers source waste cooking oil and grease trap from restaurants as feedstock for bio-diesel production*
- *Bio-diesel of type B100 is produced by all 3 suppliers*

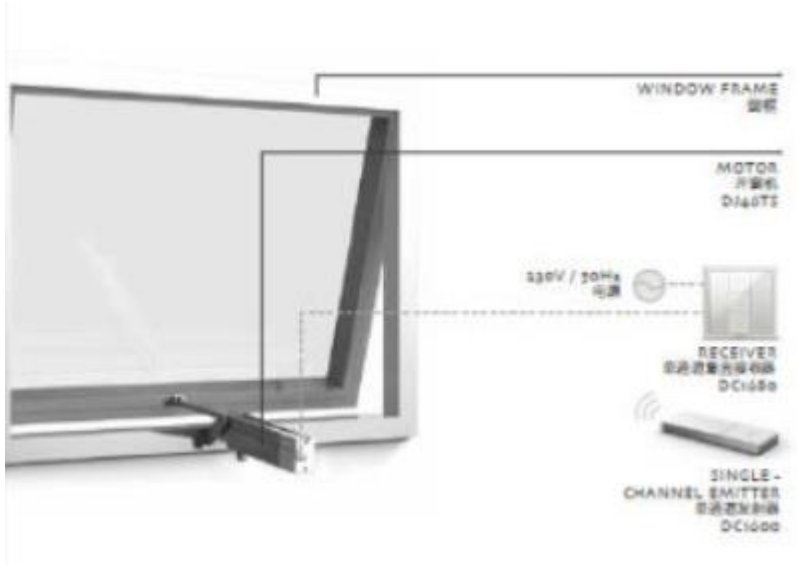
(Approval Year: 2019)

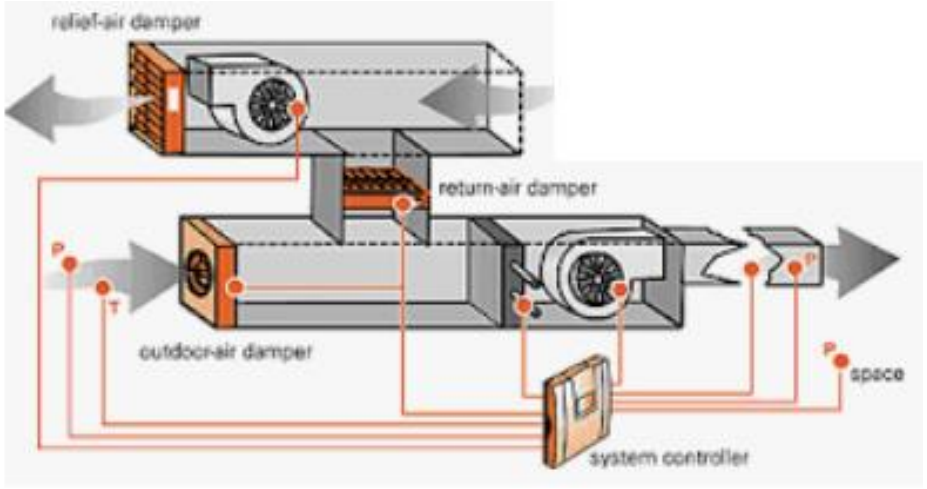
IA1- Innovative Techniques

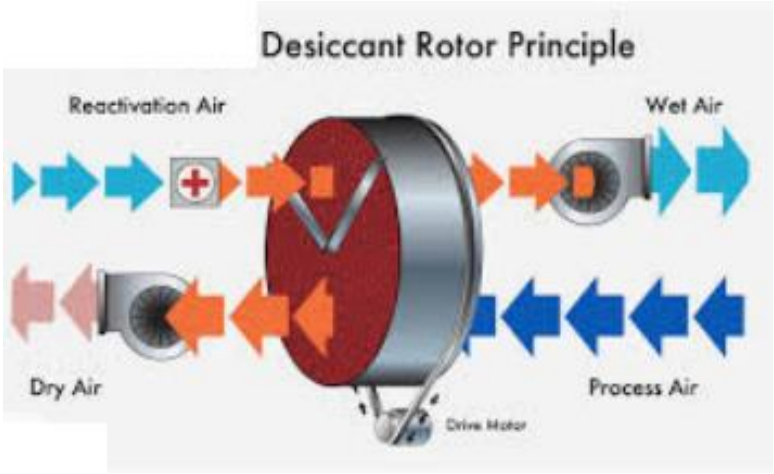
Hybrid ventilation + Multi-mode AC system

The Applicant provided hybrid ventilation analysis report, control schematic and window actuator catalogue to demonstrate the provisions of hybrid ventilation system. The hybrid ventilation system will be used in all typical office level and consists of 4 individual operating modes (Natural Ventilation; Free Cooling; Air Conditioning; and Dehumidification) to enhance the indoor air quality, energy conservation and indoor environmental quality.

(Approval Year: 2020)







IA1- Innovative Techniques

Smart Glass / Dynamic Glass

Thermochromic glass that automatically tints in the presence of heat. It ensures comfort and saves AC energy.

Needs no electrical connections as it generates power from the sun.

Unlike conventional blinds, the glass ensures that the natural light balance in the room is always pleasant, without sacrificing outside view.

(Approval Year: 2020)

Courtesy of Vario Glass

IA1- Innovative Techniques

Underground Automatic Bicycle Parking

The Applicant indicated that there is a public cycling path next to the Site. An underground automatic bicycle parking system will be provided to allow convenient bike storage for users so as to encourage the use of bicycles. A total of 433 nos. of bicycle parking space, 41 nos. of shower rooms, 1,208 nos. of lockers and maintenance tool will be designed . In addition, this bicycle parking system would take up less area on the surface ground level .

(Approval Year: 2020)

Courtesy of Giken Ltd

IA1- Innovative Techniques

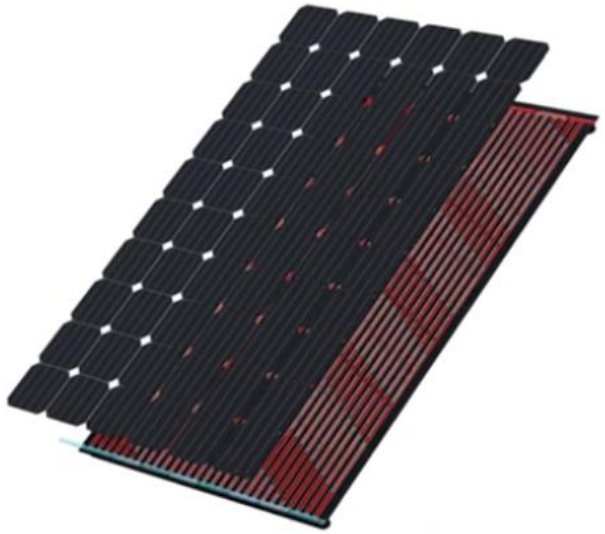
Hybrid Solar Panels

- Photovoltaic and thermal (PVT) system that generates **electricity** and **thermal energy** simultaneously

(Approval Year: 2020)

Benefits:

- Save space
- Maximize electricity production due to cooling effect



https://dualsun.com/en/

IA1- Innovative Techniques

Smart Pads in Homes – resource, health & facilities monitoring

- Residents can monitor their water/electricity consumption, TVOC and humidity levels in their units; obtain building management information; book recreational/communal facilities; and monitor waste collection information on their respective floor through a “Smart Pad” installed in each flat.

(Approval Year: 2017)

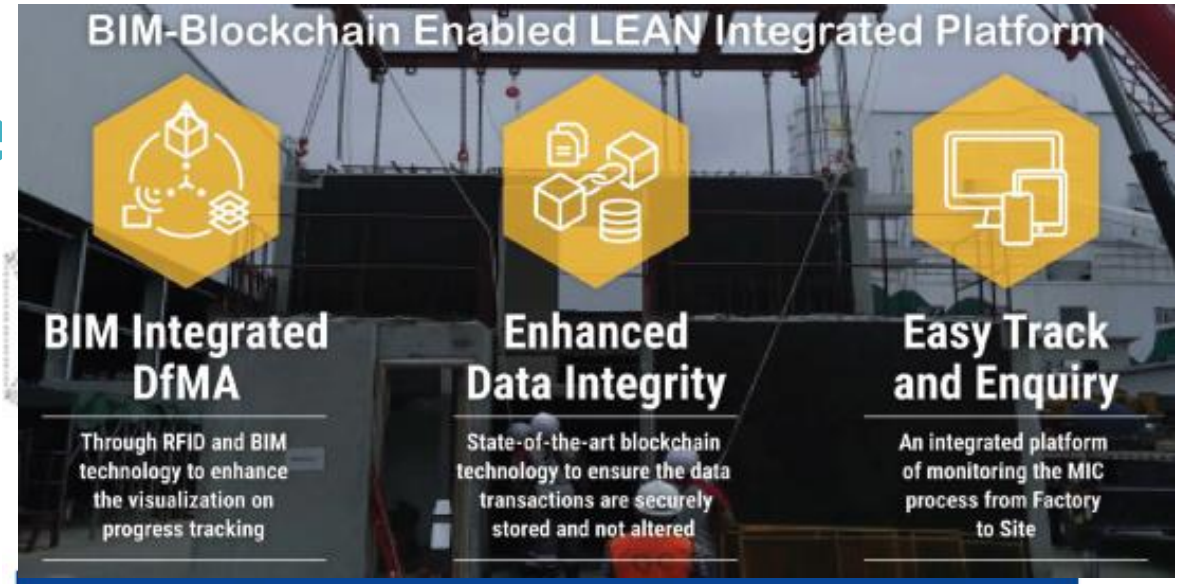
IA1 – Innovative Technique

RFID + BIM + Blockchain

The Applicant submitted the Narrative for BEANie to demonstrate that it is a system that goes beyond the BIM integration under IDCM. It allows real time tracking with RFID, to offer traceability from manufacturing off site to clients on site with automated information input. It is a combination of RFID, BIM and Blockchain that BIM integration along cannot offer.

The Applicant is reminded to substantiate that the access the system from a remote location with adjustable cameras for real-time monitoring would be allowed, and to provide calculation to demonstrate the environmental benefit by using the system in FA.

(Approval Year: 2021 – PA stage)



BIM-enabled Blockchain Multifunctional Platform

In response to the wide adoption of MiC in Hong Kong, YLC's BIM Consultant **Global Virtual Design and Construction Limited (GVDC)** and its associated company have jointly developed a BIM-enabled Blockchain Multifunctional Platform namely BEANiE to properly record, register, file or upload the test/inspection data to reliable online platform for a real time tracking and monitoring the status of every single MiC unit at each step of production. BEANiE is equipped with RFID MiC Progress Monitoring eForm System, BIM Integrated Viewer and Blockchain Browser for record enquiry as well as custom-made modular services to cater specified requirements from different offsite or onsite users such as client/ government, architects, designers, consultants, contractors and manufacturers, etc.. It is a highly secured multifunctional and multilayer platform to provide the most efficient way for the whole project team to communicate seamlessly without geographical limitation for the enhanced productivity, improved quality as well as reduced costs and time in terms of MiC production and installation.

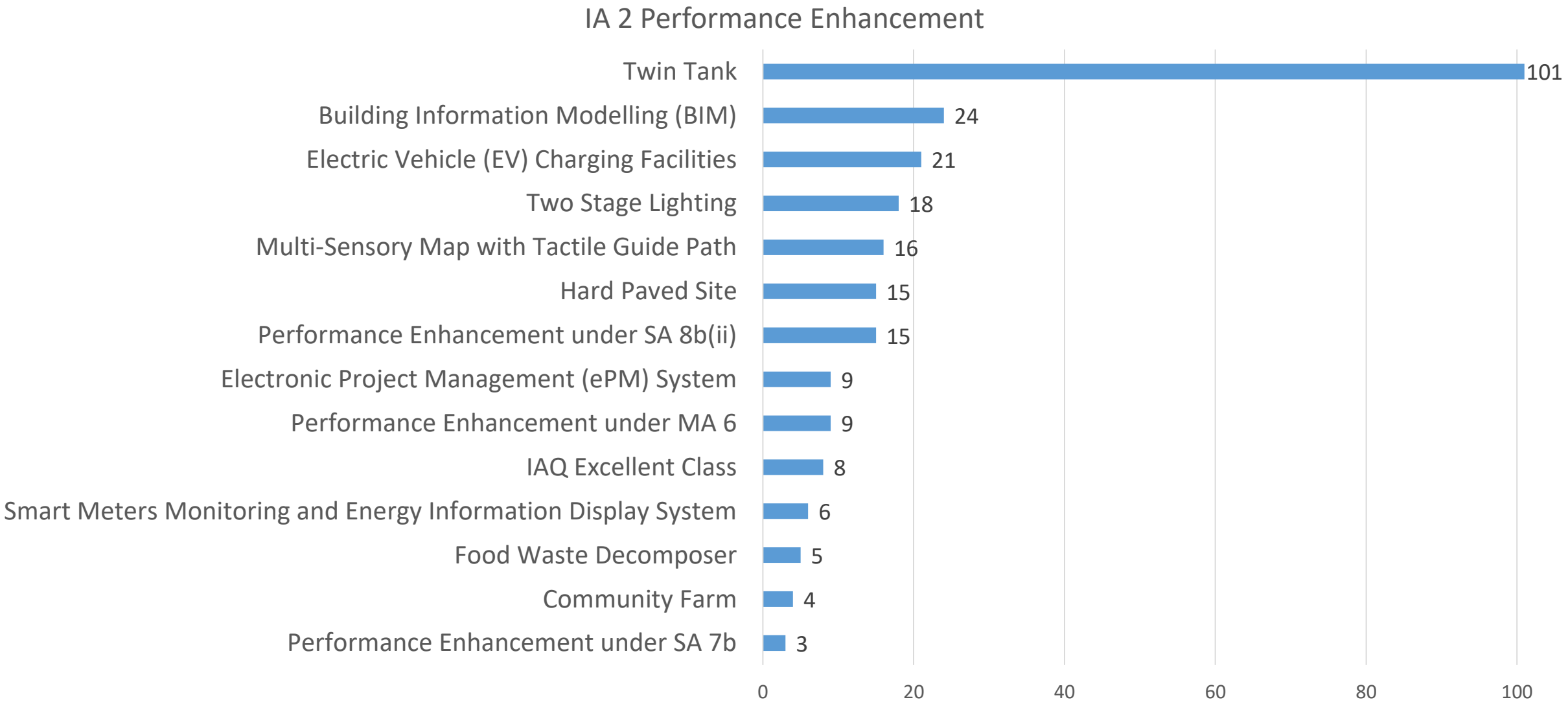
https://mic.cic.hk/en/Contractor/8

Remarks about IA1

(1) The assessment body will consider the **kind of technology** and the **extent of application** to judge whether it is an innovation worthy of a bonus (IA1) point. Typically, this would require newer kind of technology and a significant installation rather than a small trial.

(2) As time goes by, some of the above features may be adopted by more and more projects. There is a possibility that the features will **no longer** be counted as innovations due to their prevailing popularity.

IA2 – List of Commonly Used Items



IA2 – Performance Enhancement

Water Mist Cooling System

Water mist is generated through nozzles at the seating areas to provide cooling effect.

- Reduce the temperature by 5°C under 60% RH, 30°C ambient.
- No need to install mechanical fans, which will consume a lot of energy.

(Approval Year: 2021)

IA2 – Performance Enhancement

Aluminum Formwork

- Used in the construction of typical floors in residential towers.
- Several thousand cubic metres of timber formwork was saved.

(Approval Year: 2015)

Advantages:

1. Industrial standard production, the quality is relatively stable.
2. precise determination, high bearing capacity, relatively stable concrete forming.
3. Skillful workers have high construction efficiency.
4. can be equipped with a quick release system, less on-site garbage.
5. the number of turnover is high, can be recycled and refurbished.

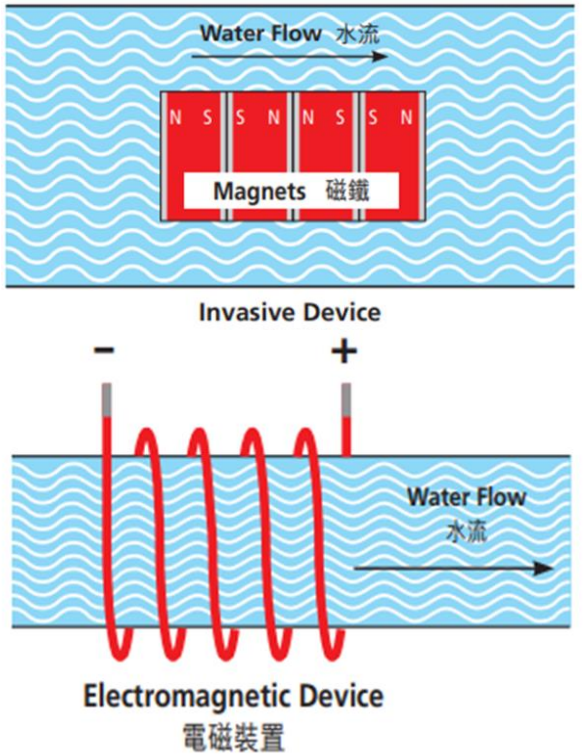
IA2 – Performance Enhancement

Physical Treatment for AC Condenser Water

Use EM fields in the condenser water piping to control scaling and biological growth. The benefits include:

- Reduction of total bleed-off volume & make-up water use;
- No need for chemical dosing pumps;
- No risk of chemical pollution.

(Approval Year: 2019)



Source: EMSD