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Vol. 21/04 | Jul - Aug 21 ISSUE

BIMONTHLY INITIATIVE BY NS BLUESCOPE MALAYSIA

STEEL STORIES

Amazing Coated Steel by BlueScope

STEEL STORIES FEATURE

Reasons to Adopt IBS with Steel

IBS (Industrialised Building System) can be defined as a construction technique in which components are manufactured in a factory-controlled environment; either on-site or off-site, positioned and assembled into a structure with minimal additional site works.



The Industrialised Building System (IBS) can be alternatively known as:

- Prefabrication
- Off-site Manufacturing - OSM (as in the US)
- Modular
- Modern Method of Construction - MMC (as in the UK)

Based on the Construction Industry Transformation Programme (CITP) which was introduced in year 2016 - 2020, the adoption of IBS in Malaysia's public sectors rose to 87% but a much lower rate of 41% was seen in private sectors. Hence, confidence must be built amidst private sectors on reasons to adopt IBS.

Source: <https://www.cidb.gov.my/sites/default/files/2021-03/Announcement%20of%20CITP%20Achievements.pdf>

IBS can be used for 3 different materials

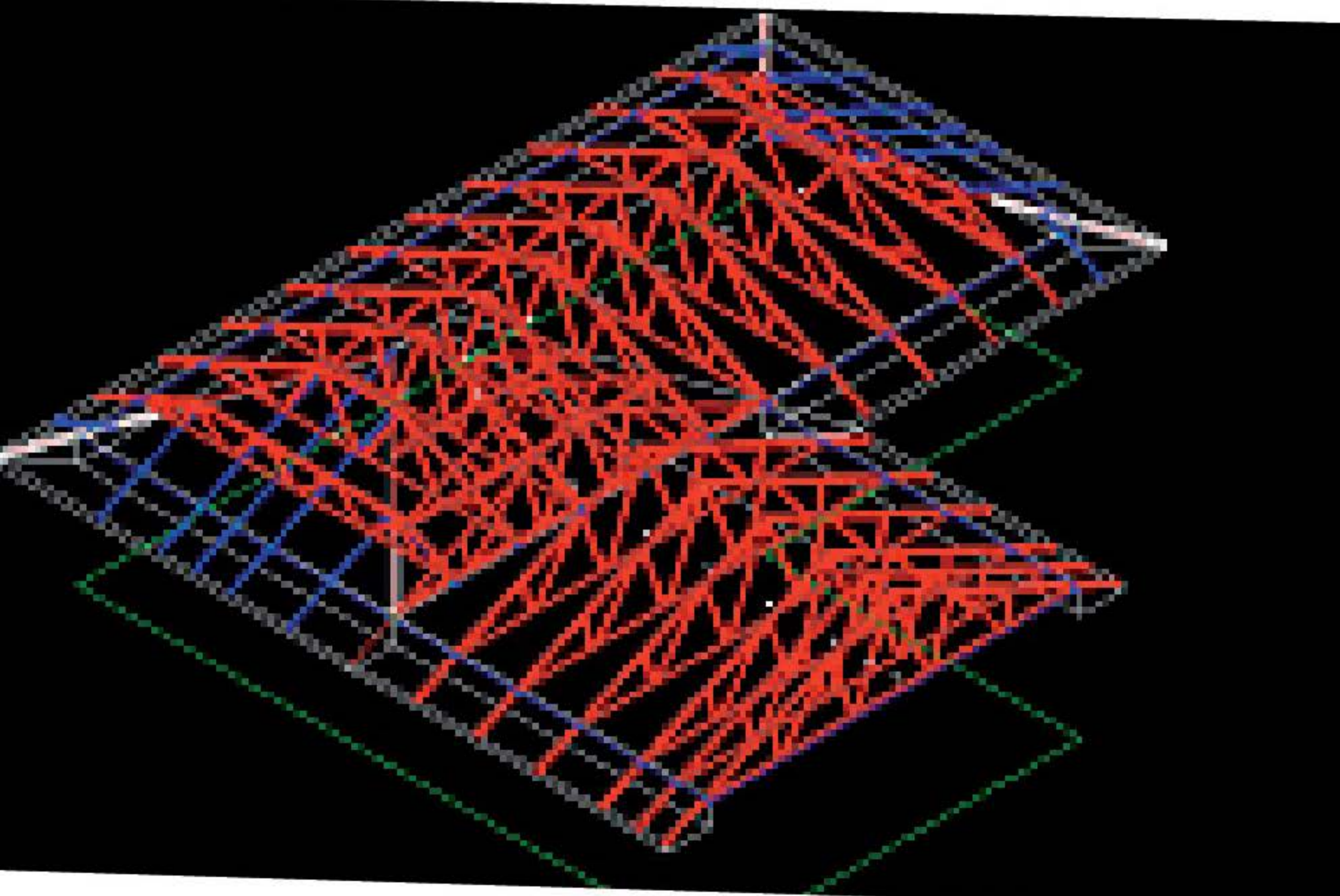
Concrete: also known as precast, commonly used for floors, walls or staircases

Timber: used for trusses or temporary formwork

Steel: used for trusses or permanent formwork such as floor decking and insulated panels

An exemplar of the IBS technology

A good usage of IBS is reflected in the ENDUROFRAME® building system which acts as a light gauge steel framing system used for designing, detailing and manufacturing for residential and light commercial markets. The advantages include:



i) Integrated Equipment and Software

The ENDURO® rollformer and ENDUROCAD® software are developed to work together for seamless operation.

ii) Compliant to Applicable Australian Standards

All structural design calculations are done as per the National Construction Code with compliance to the latest applicable standards.

iii) Compliant to the Australian Building Codes Board (ABCB) Protocol for Structural Software

The ENDUROCAD® is independently audited to confirm compliance against the mentioned protocol. Jobs that fall within the scope of this protocol can be signed off by a trained software user instead of an engineer, which, in turn, could be cost & time-effective.

iv) Builder Friendly

The framing system is fully tested in BlueScope Steel's NATA accredited laboratory and refined with input from thousands of real builds. This leads to a lighter weight framing system with optimal use of steel yet structurally sound.

v) Quick Assembly

The ENDUROTRUSS® system is entirely self-jigging and can be screwed together from the top without any welding or bolts. Additionally, the fabrication sheets output from the ENDUROCAD® software shows exactly the placement of each part and the required number of screws for the fixtures.

Smarter with Reliable Steel

The structure of the building is extremely crucial. Synergising the right material with smart design leads to a well-constructed frame and truss, which results in a building structure that stays straight and strong for generations to come.

This is well-illustrated through the compatibility of **ENDUROFRAME®** building system with **TRUECORE®** steel. Hence, an increasing number of builders have chosen **TRUECORE®** steel over the years as their preferred material. This is attributable to its many unprecedented benefits over ordinary building materials, including:

- i) **Efficiency**
The ease of use and prefabrication flexibility help to expedite the construction process which leads to better cost effectiveness.
- ii) **Durability**
TRUECORE® steel is lightweight yet strong, coupled with its 100% termite and borer proof features.
- iii) **Safety**
TRUECORE® steel is non-combustible, therefore significantly reducing the amount of flammable materials at home.



Why Adopt IBS with Steel?

- i) **Minimises On-site Wastages**
Components are pre-cut and pre-fabricated in the factory and most often these steel members are precisely cut or measured to precise length. Therefore, no wastages would be sent to the site and materials can be used more efficiently.
- ii) **Increases Productivity**
While the foundations are being constructed on-site, building materials such as lightweight steel framing can be simultaneously produced in the factory. Additionally, this too helps minimise any required storage space on-site.
- iii) **Fast Installation**
IBS with steel results in faster installation on-site. However, the levels of installation speed typically depend on the approach used. There are 3 types of IBS approaches:

a) Assembly approach

Steel members are pre-fabricated in the factory, later assembled to form panels on-site. The use of lightweight steel proves beneficial especially for projects in rural areas due to lower logistic costs and space occupied.

b) Panelised approach

Panels are pre-constructed in the factory and shipped out to the site. Despite higher space usage and logistic costs, work and space required are less as the panels can be immediately installed. This has been seen in the construction of the COVID-19 hospitals, where it only took an astounding 8 days for completion.

c) Volumetric approach

Commonly practiced in Singapore, this approach requires assembly and paneling to be done in the factory, resulting in a steel box being formed. An internal fit-out is first prepared and later assembled on-site. The logistic costs are the highest over the other approaches but it reports to be 15%-20% quicker than conventional construction methods.

- iv) **Lightweight**
Due to higher strength to weight ratio, structures are lighter, thus reducing foundation size. Lightweight steel also offers lower logistic costs and better efficiency in logistic arrangements.

- v) **Minimised On-site Labour**
It is proven that only 3 skilled workers were needed for a frame to be completed in 2 weeks. Reportedly, projects were able to use 40% lesser manpower and this too helps improve safety especially on risk exposure and social distancing.

Source: <https://www.bca.gov.sg/emailsender/microsite/Pillars-052017/future-ready1.html>

- vi) **Design Flexibility**
Lightweight steel frames can be designed in curves and this has been done in various projects such as the curved roof in Jetty Menumbok in Labuan. This allows IBS to complement versatile and modern designs. The same IBS can also be used as support for external facade panel.

- vii) **Non-flammable**
As steel is non-combustible, it does not contribute to fire incidents. In a test done by CSIRO Australia, it takes only minutes for a fire to engulf an entire house. As steel is not flammable, this enhances safety by providing more time for those trapped, to escape through doors and windows.

Source: <https://ecos.csiro.au/raising-the-standard-for-bushfire-proofing-houses/>



ENDURO FRAME

Building System in Rural Projects

In the year 2017, our government took the initiative to construct sekolah daif in Kampung Suan Lamba, Kinabatangan; a rural area in Sabah. Sekolah daif aims to improve education accessibility and infrastructure in the rural areas. Due to various perks, the IBS technology was adopted for the construction of the schools.

TRUECORE[®] steel was used with the **ENDUROFRAME**[®] building system. As the designs are pre-determined in the factory, no fabrications are done on-site and wastages are greatly minimised. Besides, installations were swift as it only took 4-6 weeks for completion, starting from installation up to the covering of roofs and wall cladding.

Despite being in a rural area, deliveries were relatively easy with minimal usage of heavy vehicle, thanks to the lightweight features of **TRUECORE**[®] steel. Additionally, the adoption of IBS promotes lesser labour, with only 15 workers needed on each site.



Since 2017, more than 30 sekolah daif were built using the **ENDUROFRAME**[®] building system with **TRUECORE**[®] steel and our very own **COLORBOND**[®] steel as roof. The team at BlueScope is glad to be part of this initiative in creating a safer and more comfortable learning space for future generations.