



GREEN AND FIREPROOF CONSTRUCTION

## **M-SIPs Hybrid Building System**

The best of two Worlds – SIPs and Stick built

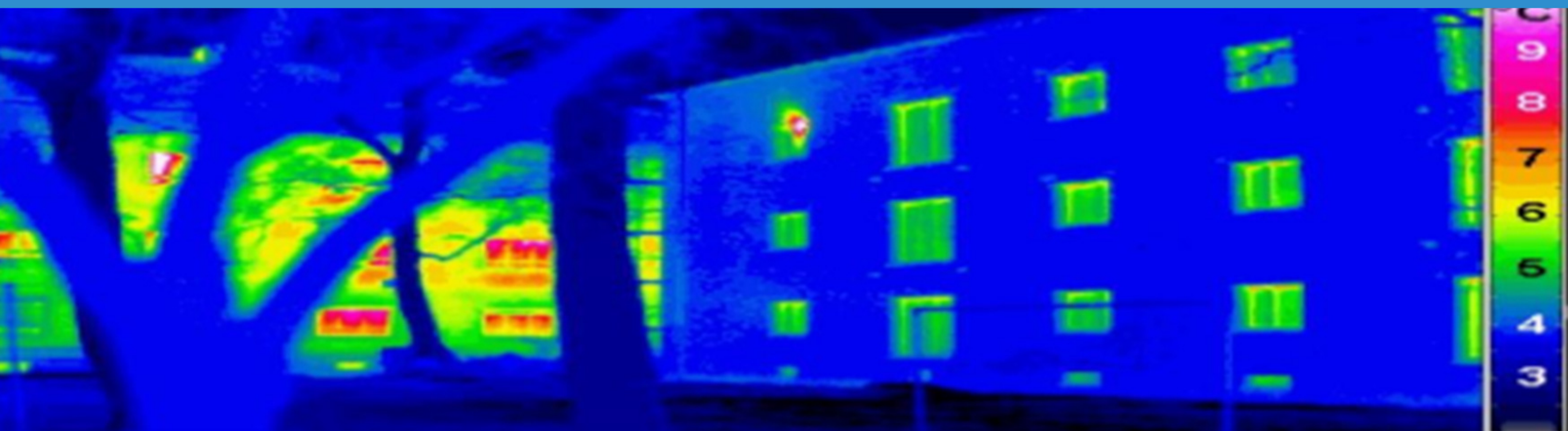
# M-SIPs Hybrid Building System:

## The best of two Worlds – SIPs and Stick built

Comprises 4” – 11” (96 – 280 mm) thick structural insulated panels (SIPs) with factory installed internal structural studs FRP (Fiberglass Reinforced Plastic or standard Steel C studs) inside the panels (Patent Pending # 62/869,740).

The Hybrid M-SIPs Building System use a simple surface Spline so each standard panel can very easily be customized. M-Sips Building System panels consist of a high-performance fiber-free rigid PUR insulation core, sandwiched between two layers of noncombustible composite structural board type, M4. During manufacture in the injection mold, the insulation core is bonded to the M4 facings. This process provides much more reliable and superior adhesion than the secondary bonding process used in the manufacture of most other SIP's. M-SIPs Building System panels are a structural composite. This M-SIPs Building System can be used to create buildings up to 4 levels. The panels are lightweight compared with brick and block, at a maximum of 26 kg/m<sup>2</sup>. As with all construction methods, including traditional masonry, long lasting external facing material is also a necessary part of walls and roofs constructed using M-SIPs Building System.

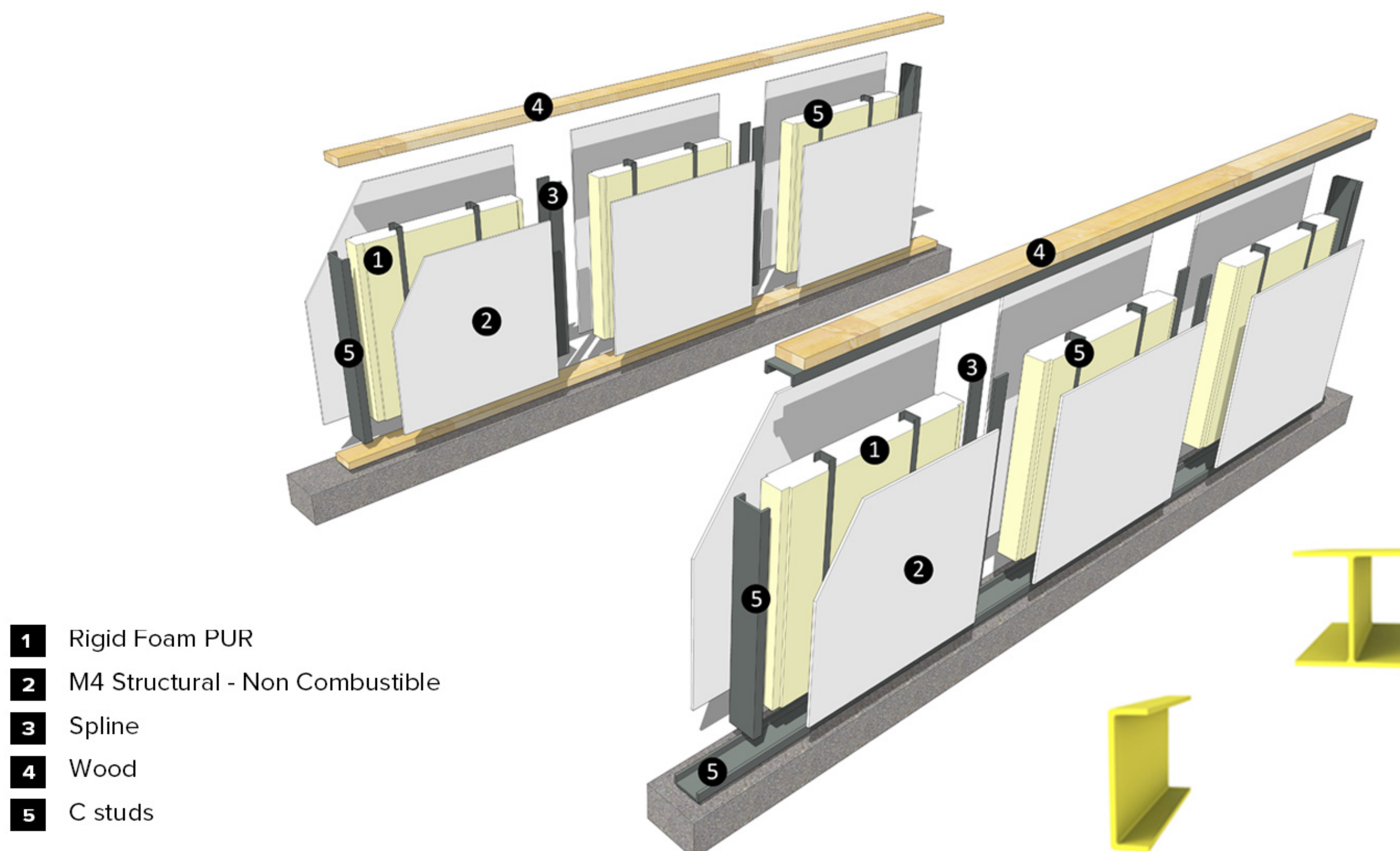
M-SIPs Building System in this document can be used as a full system or roof. Foundation and wall elements can be used individually with other non M-SIPs components, I Joist, timber rafter, light gauge steel etc.



## Design Flexibility

M-SIPs Building System gives multiple solutions for individual designs, using the standard M-Sips panels width: 45” (1140 mm) and length: 8’ – 9’ - 10’ and 18’ (2440 mm – 2745 mm – 3005 mm – 5.490 mm ).The panels are pre-cut and can easily be erected by two persons on the U track profiles or on locally provided standard lumber.

M-SIPs panels can easily be customized for doors and windows at the building site after erection. Or a complete kit is delivered to site ready for erection by our partners. M-SIPs Building System can be used to create the walls (loadbearing and non-loadbearing), roofs, foundation and basement of a complete building. M-SIPs Building System can be erected in any M-SIPs pre-approved climate zone and on any approved foundation construction.



## More floor Space:

30 – 35% thinner walls and 10 – 13% more living space when building a wall to achieve a R value of 41 and U-value of 0.14 W/m<sup>2</sup>.K (7" – 178 mm panel) using M-SIPs Building System, the structure can be just 13,11" (334 mm) thick. In comparison, a timber frame wall would be 18.78" (477 mm) thick to achieve the same insulation U-value, and a full fill masonry cavity wall to achieve the same U-value may have to have a wall 19.49" (495 mm) thick. This means that M-SIPs Building System can provide more floor space for the same external dimensions, assuming the wall constructions is detailed as above and below.

**1 M-SIPs wall 13.11"** (334 mm) = 4.03" (102.5 mm) brick, 96" (50 mm) cavity, 0.011" (0.3 mm) WRB breathable membrane, 7" (178 mm) M-Sips panel (0.021 W/m.K), 0.11" (3 mm) skim.

**2 Timber Frame Wall 18,78"** (477 mm) = 4.03" (102.5 mm) brick, 1.96" (50 mm) cavity, 0.011" (0.3 mm) WRB breathable membrane, 0.47" (12 mm) OSB, 11.22" (285 mm) glass mineral fibre quilt (0.037 W/m.K) between deep studs, 0.47" (12 mm) OSB, 0.49" (12.5 mm) plasterboard, 0.11" (3 mm) skim

**3 Masonry Full Fill Cavity Wall 19,49"** (495 mm) = 4.03" (102.5 mm) brick, 1.96" (50 mm) cavity, 9.49" (240 mm) rock mineral fibre full fill (0.037 W/m.K), 3.94" (100 mm) lega block, 0.11" (3 mm) skim.

## R values & U value

Product	R Value	U Value - W/m2.K
Roof Panel 67 – FRP	67	0.08
Foundation Panel 58- FRP	58	0.09
External Wall 45 – Steel	45	0.12
External Wall 24 – Steel C	24	0.23
External Wall/Roof 41 FRP	41	0.14
Internal Wall 19 – Steel C	19	0.30

### More floor Space:

M-SIPs Building System comprising 7” (178 mm) thick panels can achieve wall and roof R values 41 and U-values of 0.14 W/m2.K with no additional insulation. Extremely low U-values 0.08 W/m2.K, or R values 67 (Passive-House) can also easily be achieved with 11” (280 mm) thick panels.





## Fire rating:

M-SIPs Panel sandwiched between two layers of fire rated Class A non-combustible (ASTM 136), A2-s1,d0 (EN 13501:1) composite structural board type, M4. Further the M4 facing material is fire rated K1 10 A2-s1,d0 (EN 14135) and as Class B material (CAN/ULC S 124-06) – 1 hour load bearing fire rating (ASTM E 119 – REI 60) can be achieved by using facing M4 5/8” (15 mm) thickness instead of the standard M4 1/2” (12 mm) thickness. Therefore M-SIPs is very different from normal SIPs panels with combustible OSB used as skin facing material where it is needed to apply Type X Gypsum thickness 5/8” to achieve any fire rating. M-SIPs is the future of SIPs panels if you value the security of your family.

## Water Restrictive Barrier & Airtightness:

The anti-water coated M4 on the exterior facing and the closed cell structure of the rigid PUR insulation core of the panels does not allow moist movement or air movement within them and the jointing system can create very airtight constriction. The PUR insulation do not sag or physically deteriorate over time, as may be the case with other insulating types.

## Electrical cables

Electrical cables, ICT cables and coax cables are hidden in the factory provided installation channels in the panels or behind horizontal skirting lists to the floorboards/tiles and further behind vertical door molding. This provides optimal flexibility in installations, without the need to create apertures in walls. For roof panel cables are installed in the factory provided installation channels, or next to roof rafters, going vertical to wall panels back to electrical meter under floor joist.

## Thermal Bridging

Thermal bridges occur where a material with a significantly worse thermal conductivity interrupts the insulation layer in a construction. M-SIPs walls is not interrupted by repeating stud-work. Therefore, there is less repeating thermal bridging, however, some thermal bridges, e.g. where top plank are used to support point loads and in roof applications etc.



## **Zero ODP and Low GWP**

The PUR insulation core of M-SIPs is manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

**M-SIPs**

Brand name owned by Multi-Panels Corp.

[www.m-sips.com](http://www.m-sips.com)