

## Mbloc – a technical analysis

### INTRODUCTION

The Mbloc construction has been analysed and compared with similar properties of a traditional construction. With the aims of the government to reach Net – Zero by 2050 the construction industry need to adjust the use of materials to achieve the targets set. The purpose of any 'modern method of construction' is to lower carbon emissions, both that in-use and embedded.

### SYSTEM COMPARISON

The Mbloc system has U-values of 0.16W/m<sup>2</sup>K (Wall), 0.11W/m<sup>2</sup>K (roof), 0.18W/m<sup>2</sup>K (Floor) and a 57.8m<sup>2</sup> construction produces 1573kg/annum of carbon. In comparison a traditional masonry construction, using the same U values, produces 1639 kg/annum of CO<sub>2</sub>. Whilst the reduction in CO<sub>2</sub> emissions may appear small, it represents 4%, however considering that construction is believed to represent 39% of total carbon emissions, this reduction is, in context, significant. It should also be noted that using these U values the Mbloc is exceeding current Building Regulations.

### CONCLUSION

Giving an overall view, whilst the Carbon emissions are reduced, the reduction of embedded carbon is significant. The use of 'pad' foundations and suspended timber ground floor reduces concrete use by some 70%. All fabric materials meet BRE Green Guide criteria and are readily recyclable. The degree of off-site manufacture reduces the amount of site resources considerably and results in more easily controlled thermal bridging (resulting in improved Air Permeability achieving on average 3.25 air movement). The Mbloc system is easily extended, both horizontally and vertically, giving long term 'home for life' possibilities.

## Environmental Impact Analysis Statement

### Net Zero Targets

With modern government targets of achieving Net-Zero by 2050 there are big changes afoot with the building sector. CO<sub>2</sub> emissions to heat an average house were measured at 2745kg per year in 2017<sup>1</sup>. To hit government targets this must be reduced by 95% to 138kg per household.

### U Values

U values are used to measure how easily heat can travel through a certain material and, in the case of houses, structures. The properties of all the layers of construction are added to provide the total U value of that structure be it the wall, roof or floor. The lower the U value the less heat is lost and, therefore, less heat is needed to maintain the required temperature within the building. U values of properties have increased significantly over time. However, the majority still fall short of current standards. Mbloc structures meet the highest current guidelines with ease achieving the following U values 0.16W/m<sup>2</sup>K (Wall), 0.11W/m<sup>2</sup>K (roof), 0.18W/m<sup>2</sup>K (Floor).

### Embedded Carbon

Mbloc philosophy is to reduce the environmental impact of our structures wherever possible. The construction methods that produce the most CO<sub>2</sub> are the use of concrete and brick/blockwork. We have reduced the use of these materials we have removed the requirement of all brick and block products and have currently reduced the use of concrete by over 70%. Additionally all materials meet BRE Green Guide criteria and are readily recyclable. We are currently working with new foundation techniques using screw piles to remove the use of concrete completely.

### Conclusion

Carbon emissions and the amount of embedded carbon levels are optimised within this structure. This puts us ahead of the majority of the current new housing market and already meeting projected required government standards. The use of renewable technologies and innovative tank and paint systems as well as the pursuit of emerging green technologies continuing to add to the sustainability of the Mbloc concept.

<sup>1</sup> <https://energysavingtrust.org.uk/significant-changes-are-coming-uk-heating-market/#:~:text=Energy%20Catapult%20Analysis%20shows%20that,to%20692%20kg%20CO2%20annually>.