PERFORMANCE CHARACTERISTICS OF STRUCTURAL INSULATED PANELS (SIPs)

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ABSTRACT

Structural Insulated Panels (SIPs) are an alternative construction material for residential and light commercial buildings. They were developed in the USA and have been evolving quietly for 50 years and show marked advantages in strength, thermal performance and speed of installation when compared to the traditional timber platform frame method of construction. While many types of composite panel building systems have been developed, panels made from a thick layer of insulating foam (often expanded polystyrene) sandwiched between two layers of Oriented Strand Board (OSB) or plywood are usually referred to as SIPs. They are conventionally used for wall and roof construction although they can also be used in flooring systems.

Unlike stress skin panels that can be made by on-site skilled tradespersons, SIPs are manufactured off-site and require quality-manufacturing standards to ensure that the product can perform as intended. This paper provides an overview of a comprehensive research study at Napier University examining their structural performance characteristics. The study has demonstrated that SIPs perform as an effective composite material possessing the strength and stiffness necessary to sustain required design loads.

Keywords: Construction, structural insulated panels, timber.