

Framework for Teaching Constructability Analysis for Design of New Construction Materials to Engineering Students

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We intend to prepare a poster only (no full paper or presentation). [This is a work in progress.]

New construction materials and products are being developed all the time. The focus on green building, reducing the effects of climate change, and other environmental goals have been a recent impetus for new construction products and materials entering the market. There are also newer technologies available that facilitate the development of these products, such as 3D printing. Research done at universities is often a starting point for development of new products, but in order for the end products to be useful as construction materials, they need to be evaluated for their ability to be used successfully in an actual construction project.

Engineering students and faculty are very capable of creating new materials intended to be used in the construction industry, but often lack the expertise to analyze the materials from a constructability standpoint. This work documents the initial attempt to create a framework to teach engineering students construction related aspects that should be considered in their design of new construction materials. The work uses a case study method, with the framework focused initially on students collaborating on a research project developing a process for additive manufacturing of modular panels (wall, floor, and roof assemblies) predominantly from wood waste, utilizing a cold-setting process. This initial framework for teaching constructability analysis on the modular panel development can later be expanded to help teach students working in a more broad array of construction materials development projects.