



Stick-built vs. Volumetric Modular

A Comparison of Different Construction Typologies

Overview

There are a lot of questions that need to be answered before beginning to design a building; one of the most pertinent ones is the method of construction. In the US, there are two primary systems of new construction that utilizes studs and joists as primary structural members: stick-built and modular. Depending on the situation, both typologies have advantages and disadvantages in terms of constructability, cost, and maintenance.

The primary difference between stick-built and volumetric modular is in the construction process. Stick-built construction is built on site from the ground up, thus the name “stick-built.” Modular constructed is instead developed as sections in a factory, transported to a property, and assembled together in the field. While there are many forms of modular construction, this white paper focuses on volumetric modules built of studs and joists.

Stick-built construction

Stick-built framing is the older and more traditional method of construction; it remains the more common typology for new construction in both single-family and multifamily buildings. Stick-built is very likely what someone may think of when considering new construction: a

superstructure of wood timbers or light gauge steel sections is assembled on site from the bottom up, and then wrapped in sheathing on both sides. This is generally gypsum board on the interior and plywood on the exterior.

There are two major types of stick-built construction: balloon framing and platform framing. Balloon framing is by far the older type, having been around since the 1860s in the United States;¹ it utilizes studs that run the full height of the building. However, starting in the 1930s and up to today,² platform framing is the more popular form, because it requires shorter lumber than balloon framing and the fire risk associated with unprotected cavities. Platform framing breaks up the long studs into smaller segments by constructing each level individually, with floors providing breaks between layers of studs.

Stick-built construction provides several advantages over modular construction. There is a greater flexibility of design choices because of its in-situ development and more versatile nature. This extends into the construction phase, in which stick-built projects are far more adaptable to sudden changes or additions that may arise. There are also fewer restrictions on where stick-built can be utilized because of the smaller equipment needed and the need for large-scale shipping in modular construction; this also results in fewer shipping and material

handling costs, as generally, no oversized products or equipment are necessary.

Modular construction

Modular construction is a more recent innovation, with modular buildings first becoming commonplace in the early 1900s in the form of catalog homes and post-War developments.³ Contemporary trends in modular construction, in which rectangular modules are constructed in a factory, then craned into place on site, were developed more recently in the 1990s. Modular construction remains less commonly used, comprising 2% of new single-family buildings and 1% of new multifamily buildings in 2021,⁴ although this is expected to increase over the next five years.⁵

The modular construction market was worth over \$67 billion in 2019 and is expected to increase 63% by 2027.⁶

Because of the variety of types associated with modular construction, advantages are more situationally dependent. Factory manufacture means there are usually fewer weather delays and the construction process is more streamlined. There is also no need to store construction materials on site for long periods of time; therefore, material and labor costs are generally lower for modular construction than equivalent stick-built construction. Depending on location and how common modular projects are in a given area, this could result in an average cost savings per square foot by building modular. Furthermore, because of the streamlined construction process, there is generally less material waste overall.

Contact JLS Architects to learn more and see what’s right for your project.

Citations

- 1 Philip Langdon, How the Wood-frame House Became America’s Most Familiar Building (Common Edge, 2022)
- 2 Scott Sidler, Timber, Balloon, or Platform Frame? (The Craftsman Blog, 2012)
- 3 Cody Tromler, Stick Built Home vs Modular: Which is Better? (UpNest, 2022)
- 4 Danushka Nanayakkara-Skillington, Modular and Other Non-Site Built Housing in 2021 (NAHB, 2022)
- 5 Prefab Home (BuildGreenNH, 2022)
- 6 Modular Construction Statistics: A Rapidly Growing Industry (Vesta Modular, 2021)

