

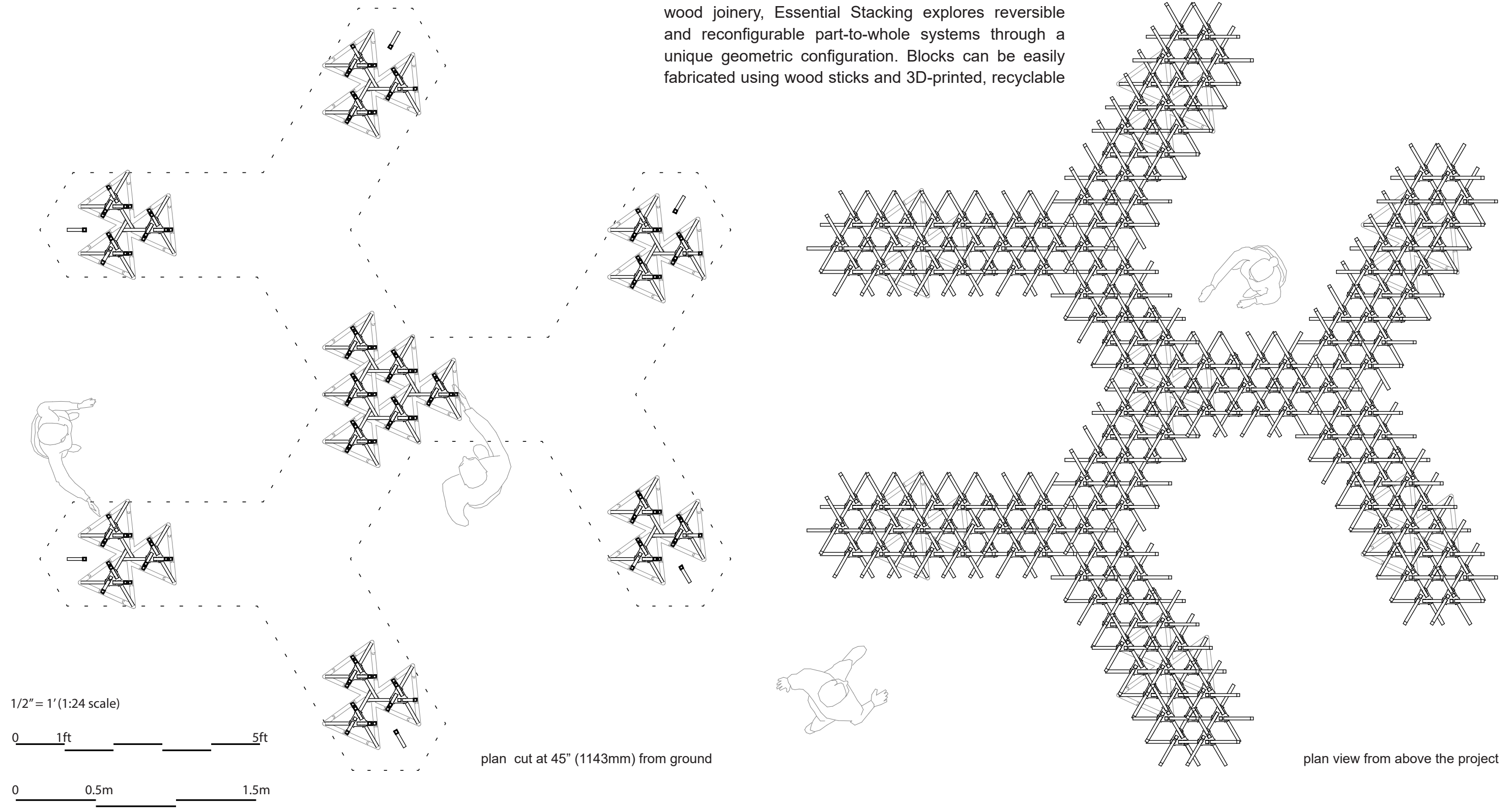
# Essential Stacking

“Stacking” is one of the most fundamental building actions. In nature, agents stack branches, rocks, and materials from their surroundings to form constructs such as termite mounds, beehives, beaver dams, and bird nests. Without carbon-intensive bonding methods, their part-to-whole systems take advantage of simpler methods such as jamming, interlocking, and weaving, resulting

in formations that are both effective and sustainable. Unlike the industrial culture of using concrete and steel, traditional woodworking embraces resource limitations, and interlocking details of separate wooden pieces can be used to remove the need for mechanical fasteners in larger assemblies. One such typology where these techniques prove essential in construction is in the works of “Daemokjang” in Korea [1]. Rooted in carbon-neutral wood joinery, Essential Stacking explores reversible and reconfigurable part-to-whole systems through a unique geometric configuration. Blocks can be easily fabricated using wood sticks and 3D-printed, recyclable

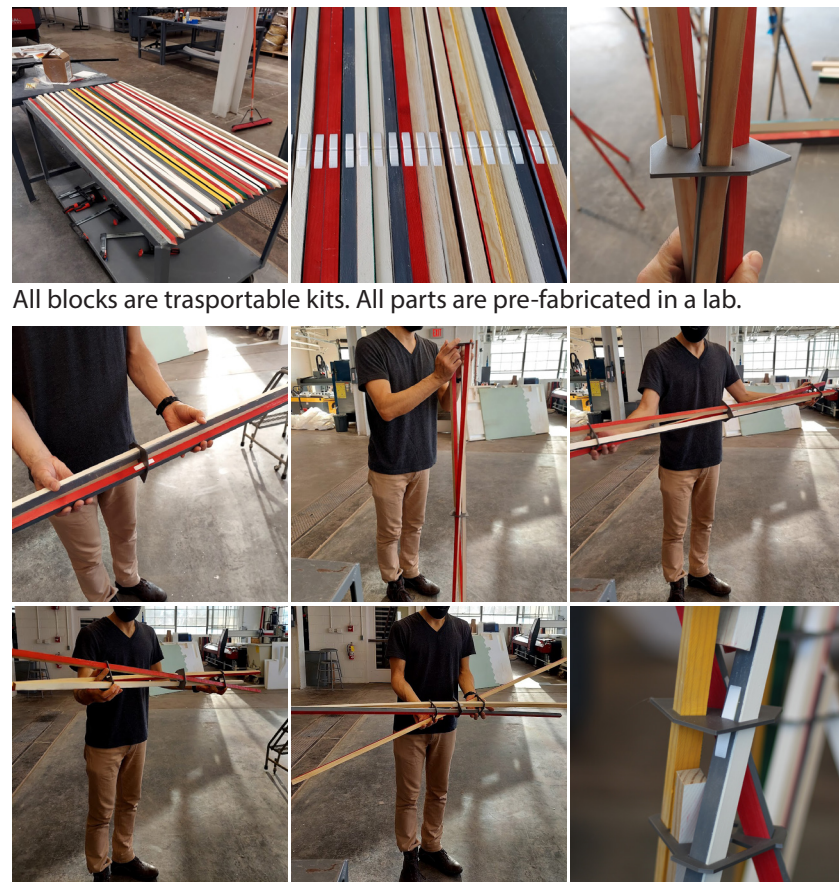
PETG centerpieces. Eight blocks complete a rhombohedral module which can grow in all directions without tools or complex bonding mechanisms. The boundary is flexible, and all parts are transportable kits that can be conveniently disassembled for another time, location, and shape.

[1] The traditional wooden architecture listed in UNESCO Intangible Cultural Heritage. <https://ich.unesco.org/en/RL/daemokjang-traditional-wooden-architecture-00461>





**Scaled model (1:6.67)**  
(1/3 of the proposed project. To test the assembly sequence)



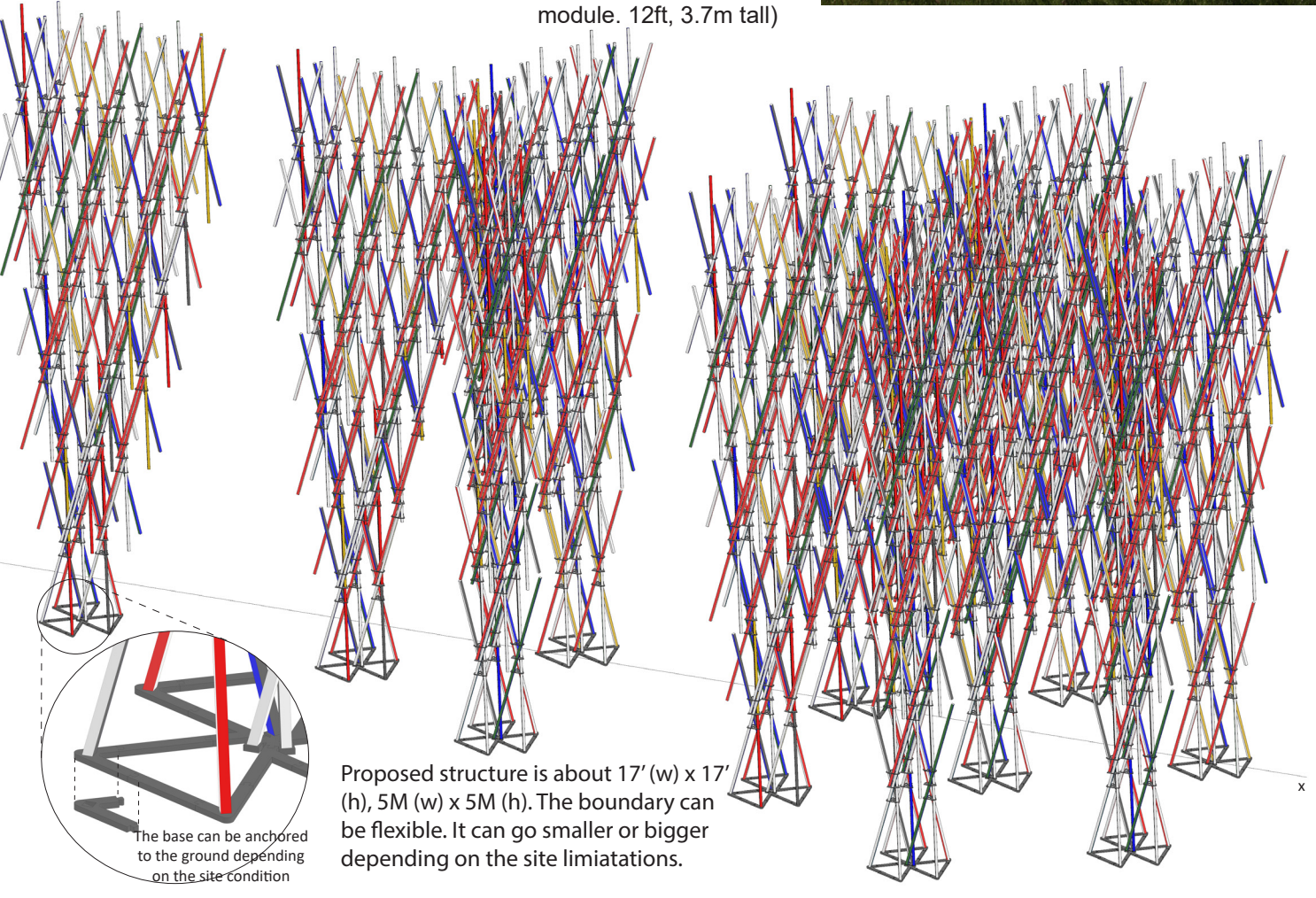
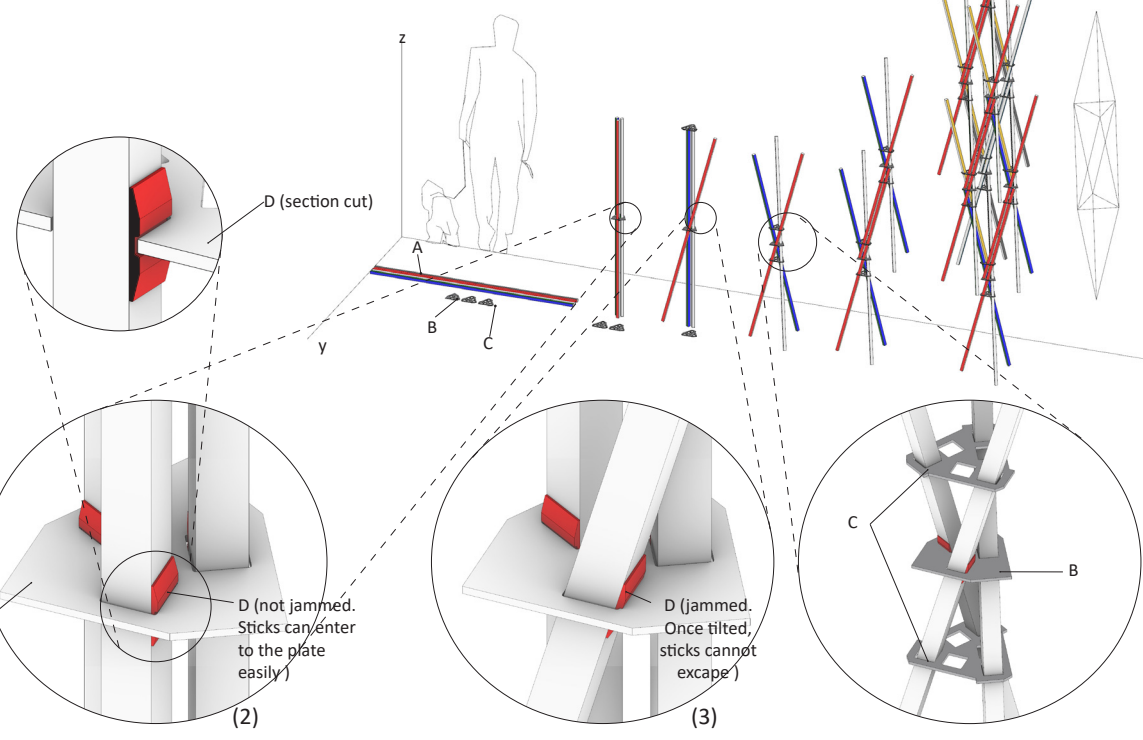
All blocks are trasportable kits. All parts are pre-fabricated in a lab.

Easy to transport the pre-assembled blocks. Simply tilting sticks on site make blocks. All can easily disassemble and go back to the trasportble kits for storage.

**Full scale mock-up**  
(8 blocks complete 1 rhombohedral structural module. 12ft, 3.7m tall)



**Material preparation:**  
 A. wood sticks. 3/4" x 3/4" x 5' length. Cost effective production of blocks. Pre-fabricated, off-the-shelf module, approx. cost \$1.60 per stick. Exterior grade latex paint and primer. Approximate cost (paint) of \$50 / gallon. 400sf coverage per gallon / each stick is 1.25sf / allow for 5 gallons of paint minimum. \$250 total cost. Approximate cost (primer) of \$31 / gallon. 250sf coverage per gallon / each stick is 1.25sf / allow for 7 gallons of paint minimum. \$217 total cost.  
 B. 1/16" thickness center steel plate (waterjet cut) or 3d printed 1/8" PETG  
 C. top and bottom plate (1/16" thick steel or 1/8" PETG). Based on the calcuated geometry, pushing these plates to the center create jamming which guide the shape of the block.  
 D. 3d printed plastic wedge. While it is easy to put it in the transportation mode (2), it produce jamming when top/bottom plates are inserted and tilted (3). Wedges to be secured in place with set screw to each stick for proper alignment / placement.



Proposed structure is about 17' (w) x 17' (h), 5M (w) x 5M (h). The boundary can be flexible. It can go smaller or bigger depending on the site limiations.

The base can be anchored to the ground depending on the site condition