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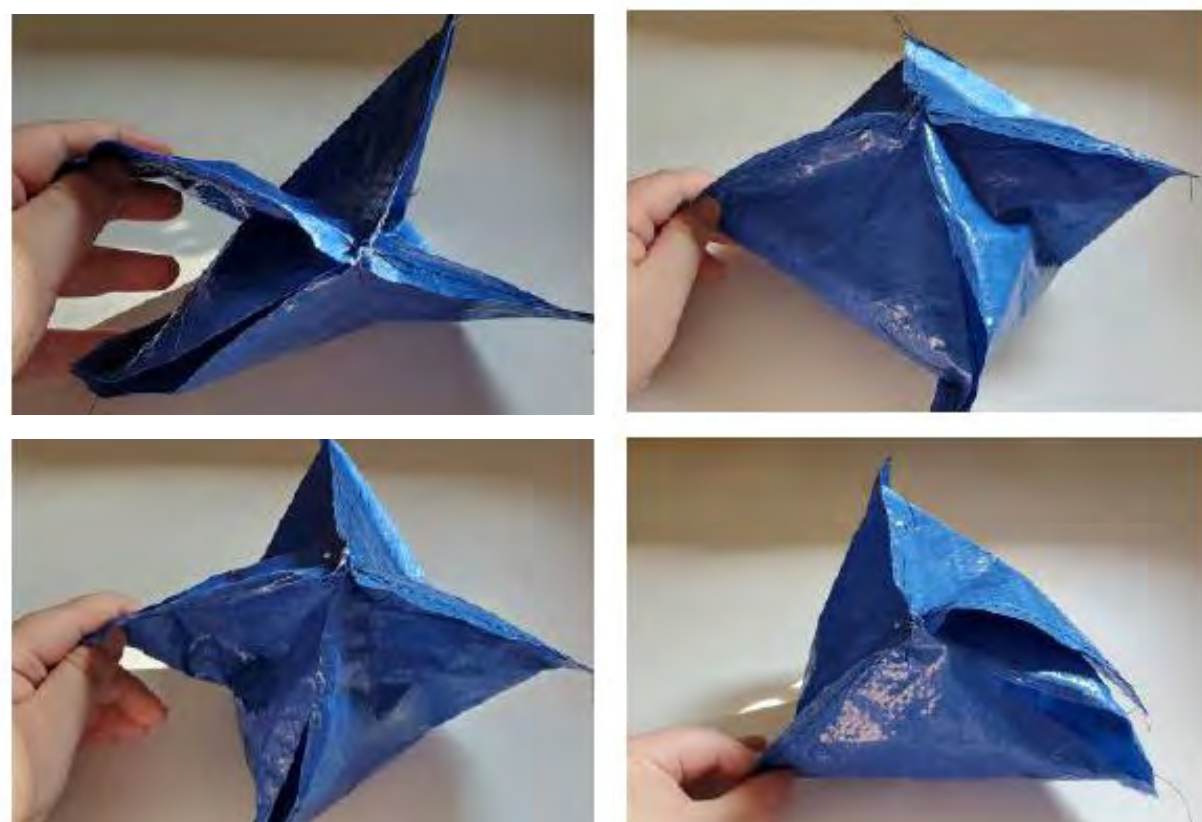
RE-EXAMINING SEWN EARTH BAG GEOMETRIES AND THEIR IMPACT ON STRUCTURE AND CONSTRUCTION WORKFLOW

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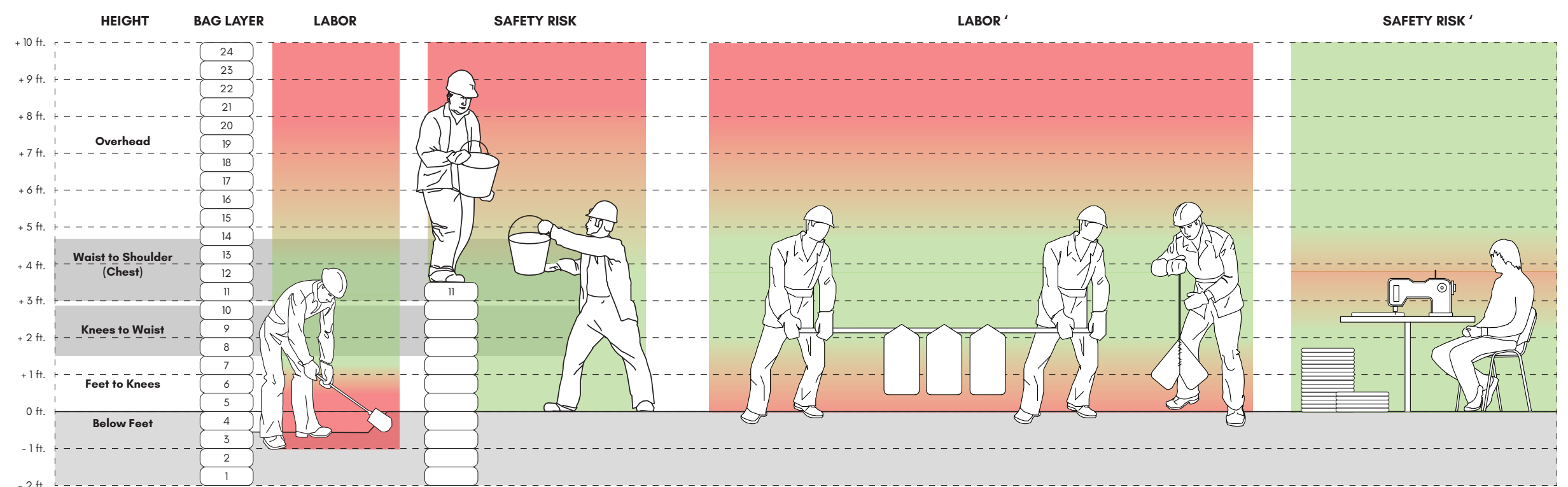
RESEARCH CONTEXT

Earthbag construction, also known as flexible form rammed earth construction, takes advantage of the sandbag's capabilities to contain and support the earth as it is compressed and hardened.

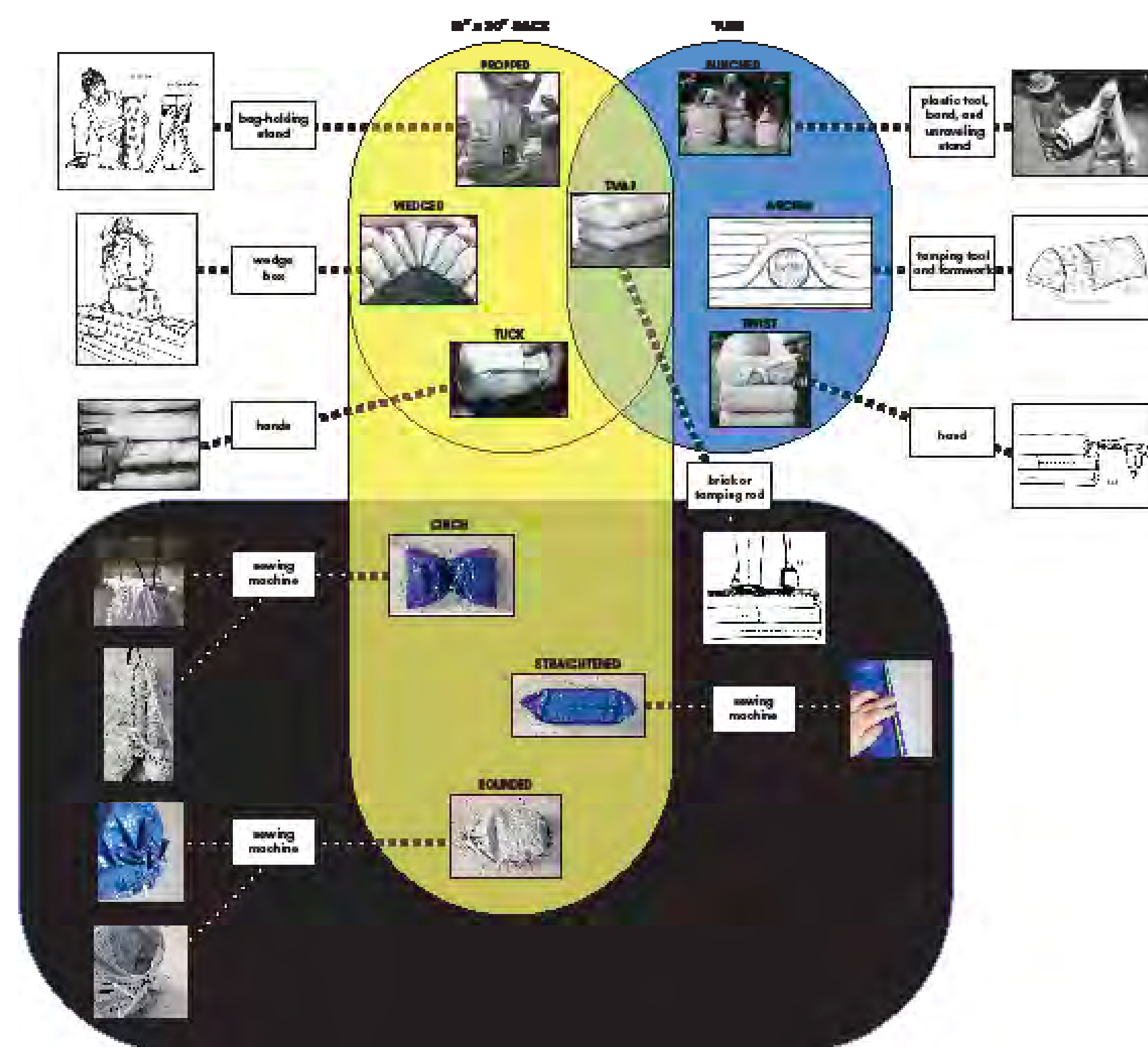
However, when compared to other earth construction techniques, earthbag construction is not as robustly tested. A lack of building regulations and safety requirements pertaining to earthbags consequentially restrict its application in non-code zones. Furthermore, since its formal conception in the 1990s, earthbag construction has not significantly progressed beyond being regarded as a container for earth.



ABOVE: SURPRISE STAR: 4-to-3 point manipulation



ABOVE: Hypothetical Labor and Safety Risks Pre- & Post-Customization.



LEFT: Ways that Polypropylene Bags Transform in Conventional Earthbag Construction.

GREYED SECTION: Ways that Polypropylene Bags Transform in Sewn Earthbag Construction.

EARTH BAG EXPLORATION

In conventional earthbag construction, the bag — typically a 18" x 30" sack or continuous tube — can be transformed into different configurations with the help of supplementary tools. A sack-shaped earthbag, for example, can transform into a key for an arch when tamped into a wedge box. Similarly, a tube-shaped earthbag can be laid and compacted on top of a solid formwork to create a continuous arch. In summary, there are two primary elements to earthbag construction: the initial bag and the customizing tool.

Conversely, what would earthbag construction look like if, in lieu of the customizing tool, the earthbag was to be the customized element instead?

This study approached this question by using the sewing machine as a tool to customize the earthbag prior to the earth-filling process of earthbag construction. The overarching goals of the study thus included the following: (1) to improve earthbag accessibility in craft, (2) to optimize or improve the earthbag as a module for carrying earth, and (3) to revisit the craft at the scale of the earthbag.



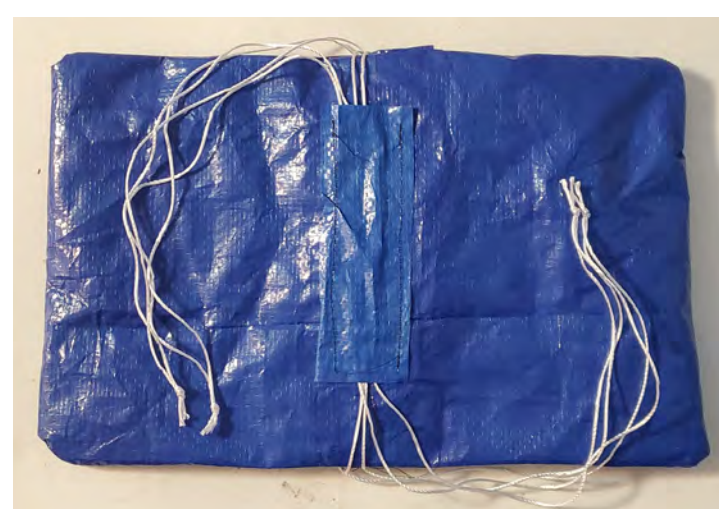
EMBEDDED STICK MOD:
Threading a 4mm dowel



EMBEDDED STICK MOD:
Adding stiffness to the polypropylene surface



HEXAGON PROTOTYPE:
6 x embedded stick mod
1 x drawstring mod



BI-CINCH PROTOTYPE:
Unfilled



BI-CINCH PROTOTYPE:
Filled and cinched



BI-CINCH PROTOTYPE:
Filled, cinched, and propped



CORNER-STITCH PROTOTYPE:
1 x drawstring mod
1 x corner-stitch mod



CORNER-STITCH STACK:
2 courses vertically joined with
a center dowel



CORNER-STITCH TRI STACK:
3 courses vertically joined with
a center dowel



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