BeTA Pavilion  [Biotensegrity Textile Assemblies]

Diane Davis-Sikora*, Rui Liu¹, Linda Ohrn-McDaniel¹

¹College of Architecture and Environmental Design, Kent State University
132 S. Lincoln St. Kent, OH 44242

dmdavis@kent.edu

²The Fashion School, Kent State University
201 E Erie St b, Kent, OH 44242

Abstract

Born in art, the tensegrity logics has been advanced in disciplines from architecture and human anatomy. Biotensegrity principles introduce an adaptive, ‘living’ structural model characterized by networks of interconnected components and tendons with a shape adaptive capacity. Bending-active is an approach to form force equilibria that adopts actively curving beams and surfaces within their elastic ranges.

BeTA Pavilion explores the formal opportunities of biotensegrity logics using elastically bent glass fiber reinforced plastic rods and CNC knitted textiles. Its bending-active systems (inspired by vertebrae typologies) is comprised of pre-stressed and self-stabilized tetrahedron modules that are arrayed and sequenced to produce structural equilibrium with a bandwidth of dynamic motion.

This paper will summarize the conceptual development, material detailing, fabrication and iterative form-finding processes for the pavilion formulated through systems thinking.

References