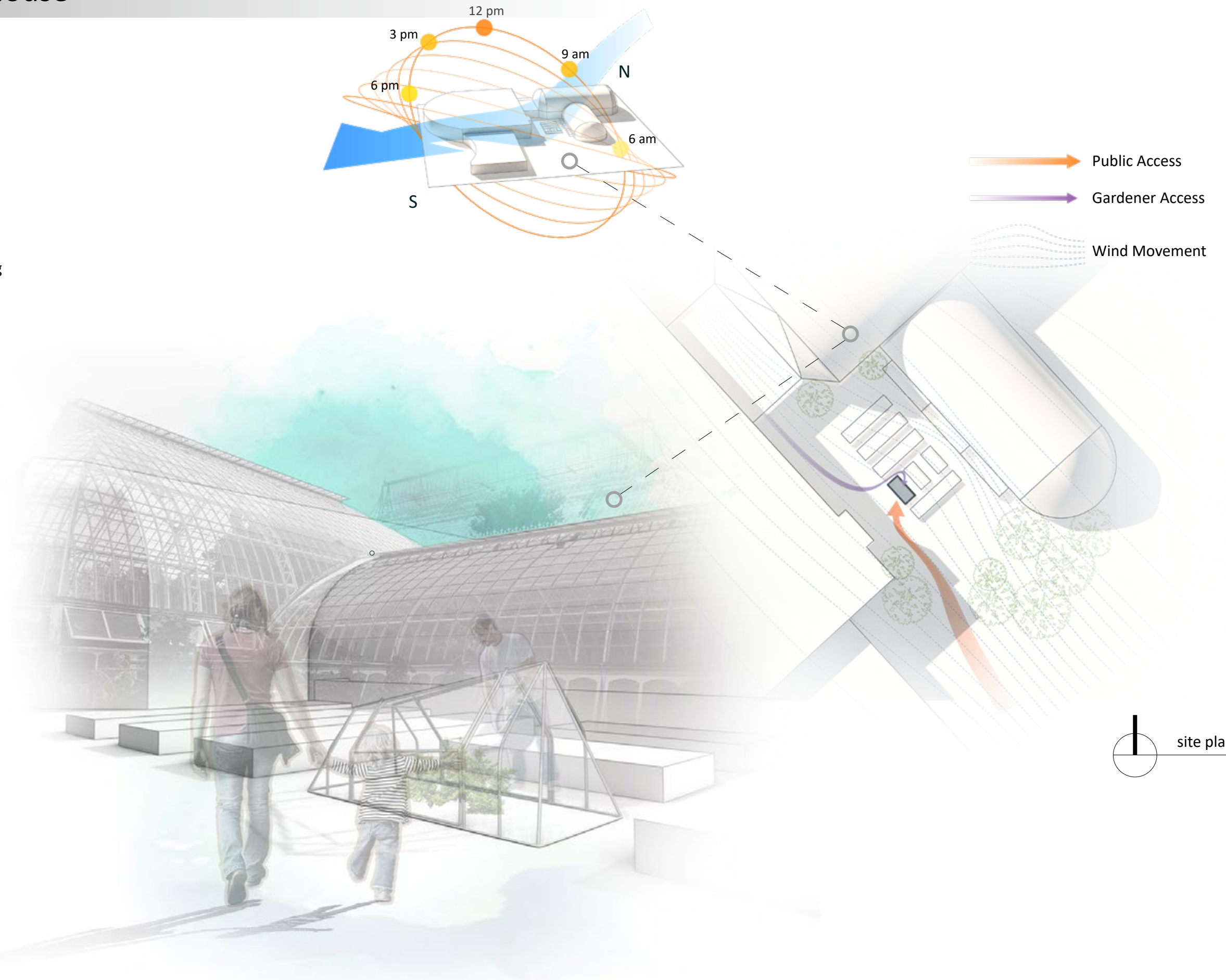


FLUGAL -- Hoop House

In this project, we are assigned as teams of five to design a greenhouse for a designated planter bed at the Phipps Conservatory Garden, using 1/2" thick electrical conduits to build the structural frame and plastic sheets to make the protection membranes. The primary goal is to keep the plants growing inside the Hoop House warm and protected from the wind during the winter, and to facilitate the access of the gardener to the plants. Besides, our design also needs to achieve some structural complexity so that it is not a simple box house.

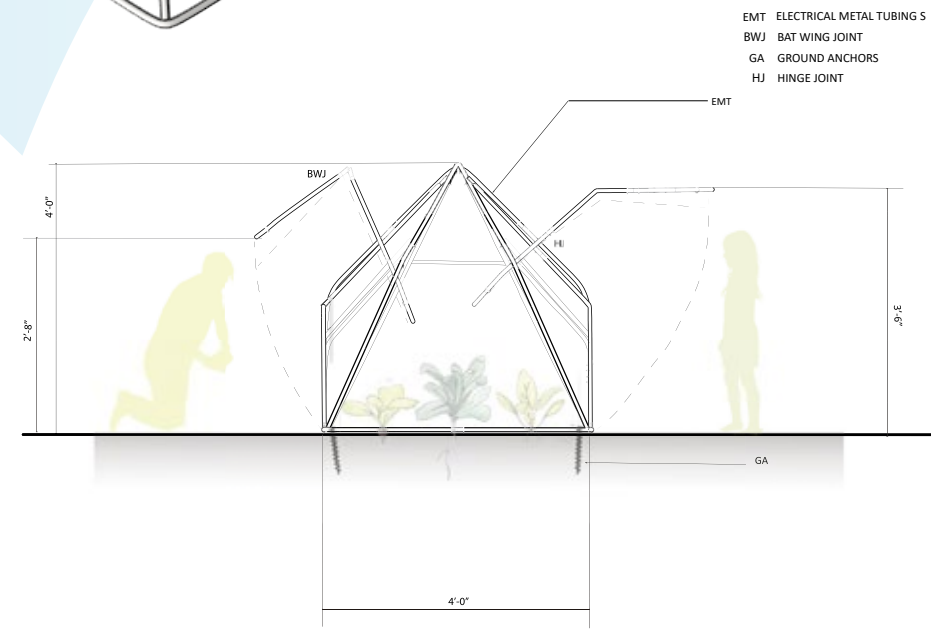
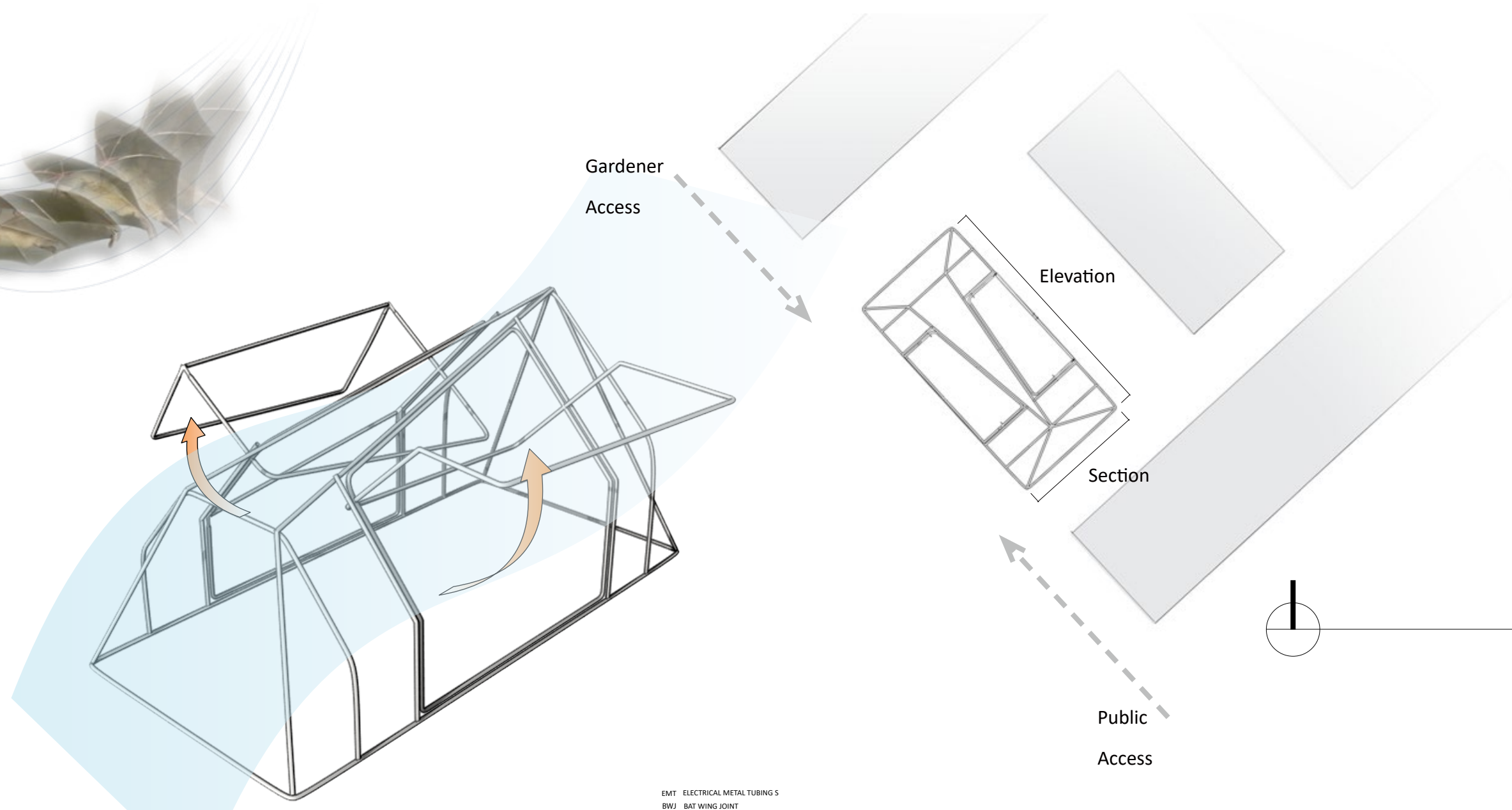


site plan

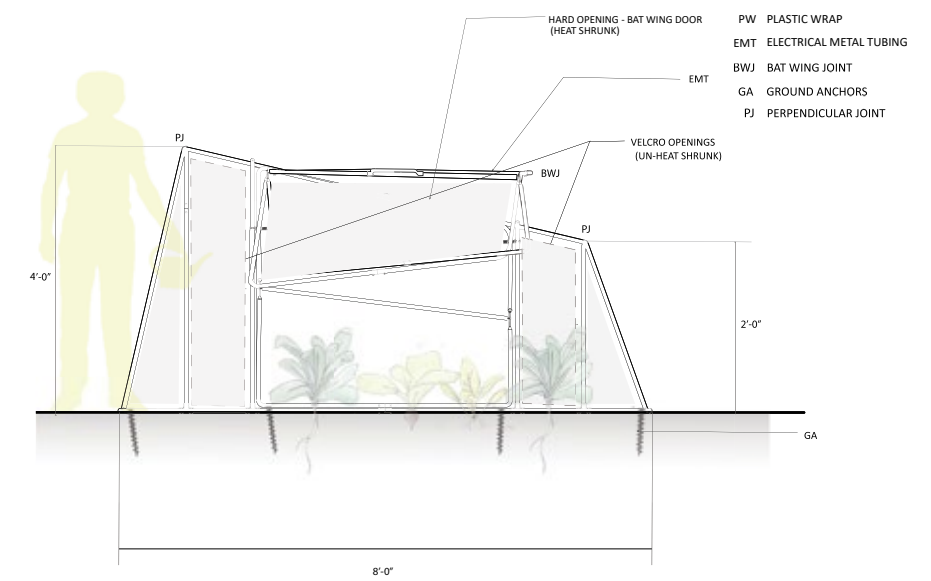


DESIGN CONCEPT

We were inspired by biomimicry, and specifically by the structure and behaviors of bats. Bat is able to move aerodynamically in the wind. It hibernates during the winter and protects itself against the wind with its wings. This triggers our design of a wind-tapering structure that diverts the movement of the wind and protect the plants inside. In addition, the opening and closing of the bat wings also inspires our idea of a rotatable goal wing door and a stretchable bat wing door.



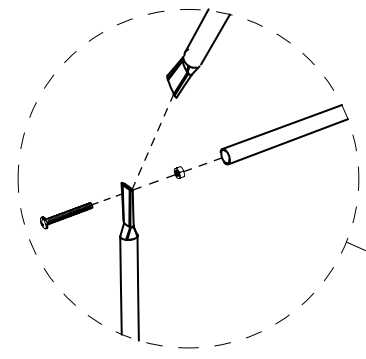
Section



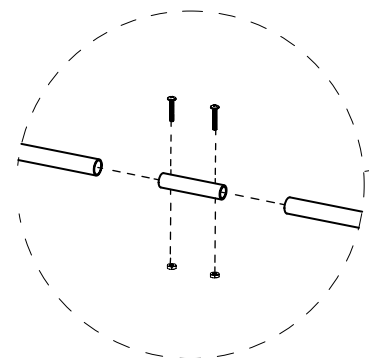
Elevation

COMPONENTS & JOINERY

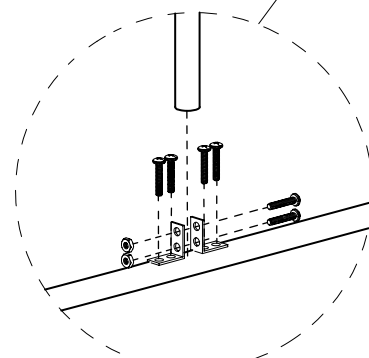
To facilitate the construction process, we divided the whole structure into the following components: base frame, spine frame, hexagon, pentagon, gull wing and bat wing. Most joints are easily resolved with a connection slot (cut from CPVC pipe or acrylic pipe) and typical screwing. But in cases of perpendicular joints or movable joints, prefabricated steel products, such as corner brackets and steel washers, must be purchased in advance and added to the joinery area.



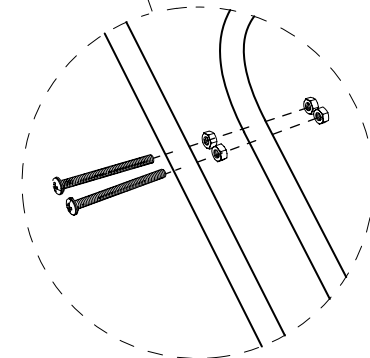
Joint Type 1:
Crimped Conduit Ends with Screws



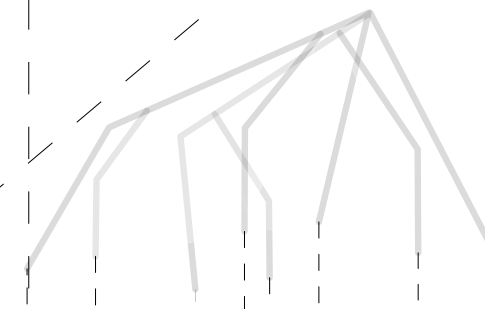
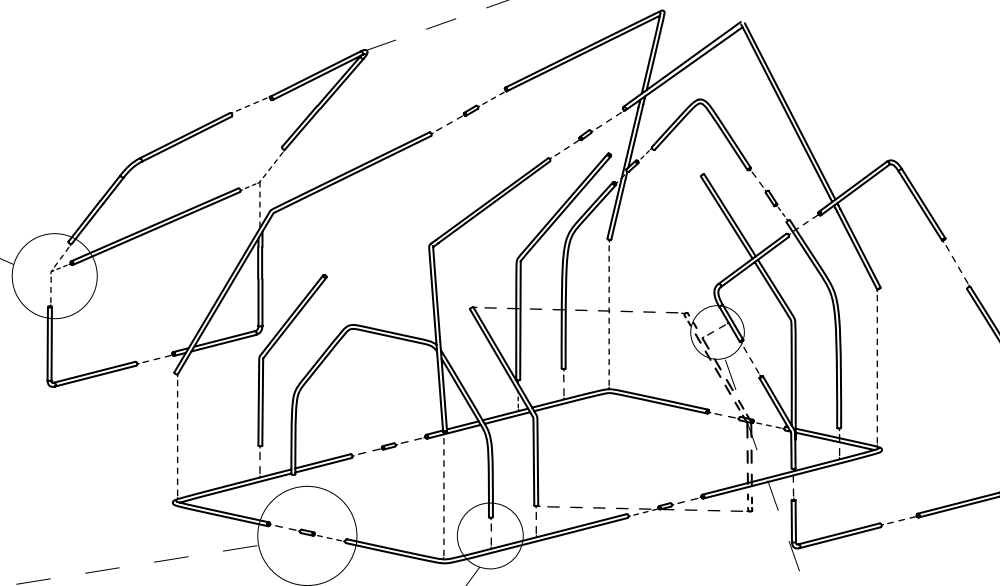
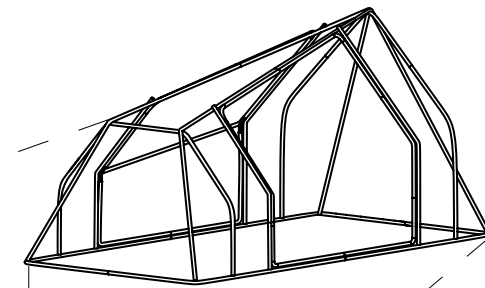
Joint Type 2:
CPVC Pipes with Screws



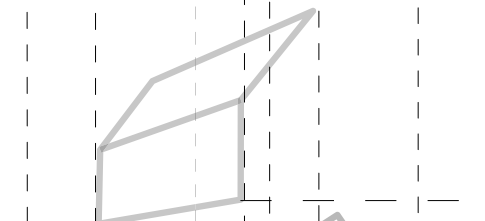
Joint Type 3:
Steel Corner Brackets with Screws



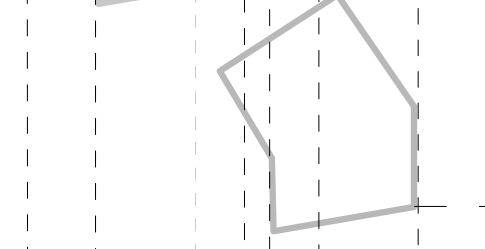
Joint Type 4:
Steel Washers with Screws



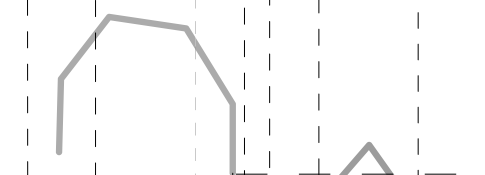
Spine Frame



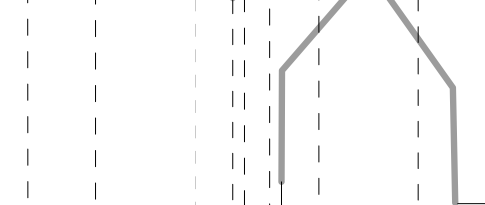
Bull Wing



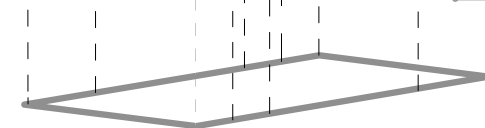
Gull Wing



Hexagon



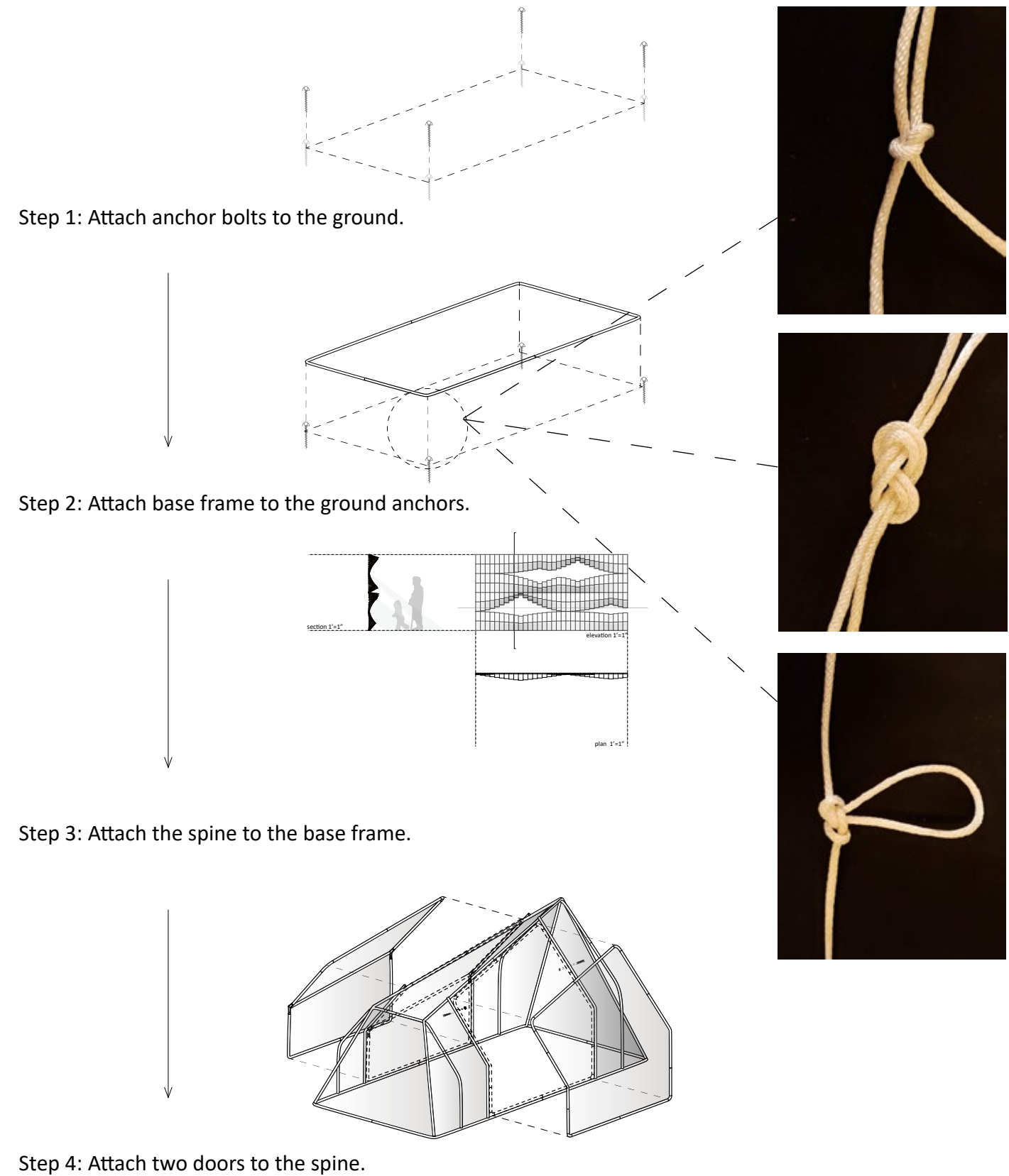
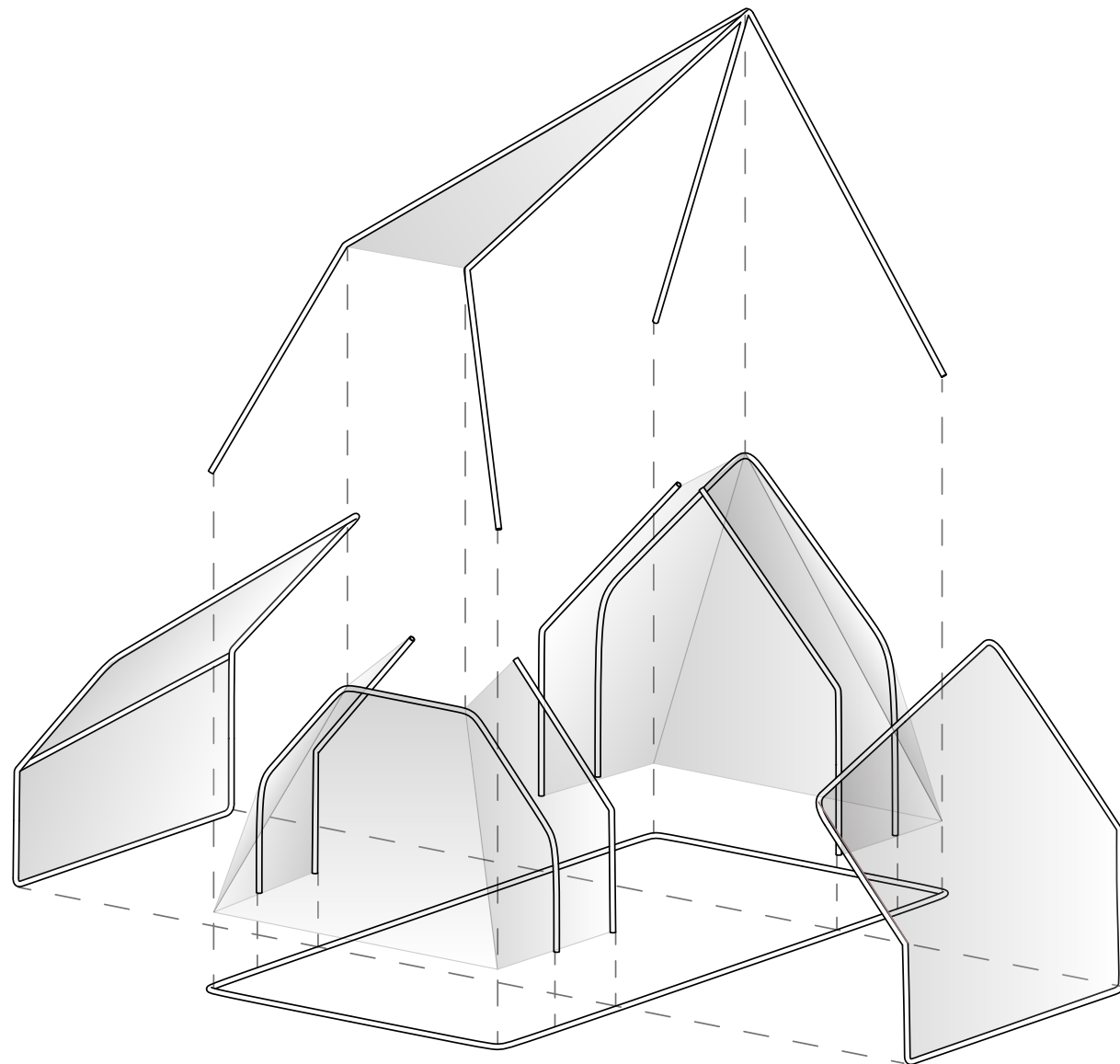
Pentagon



Base Frame

PROTECTION & INSTALLATION

This final step is to attach the plastic protection membrane to the conduit structure and install out Hoop House on the site. The plastic is divided into six pieces and cut out from a large sheet, after which they are sewed with fishing wire onto the structure. Finally, after the Hoop House is carried to the site, ground anchors are secured to the ground that connect to the Hoop House through rope knots shown in the photos on the right.



PROCESS DOCUMENTATION & FINAL MOCKUP

