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4.510 Digital Design Fabrication
Fall 2008

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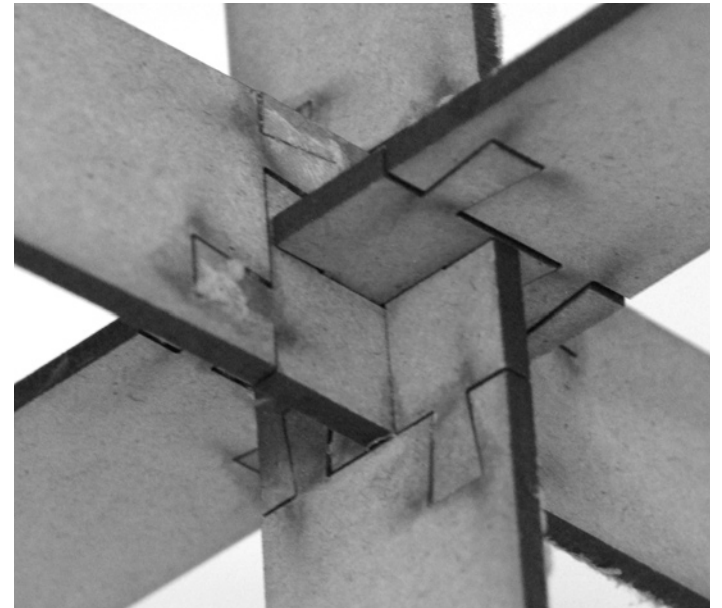
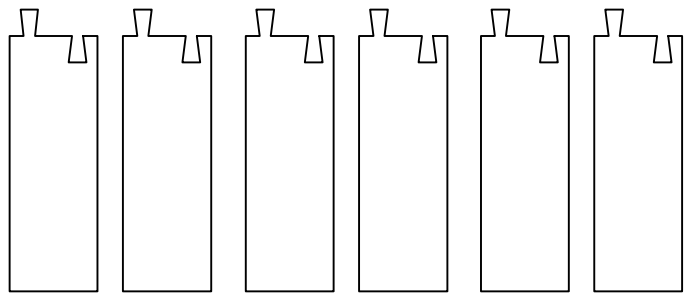
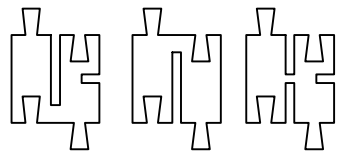


ornamental structures

assignment 5 | digital design fabrication

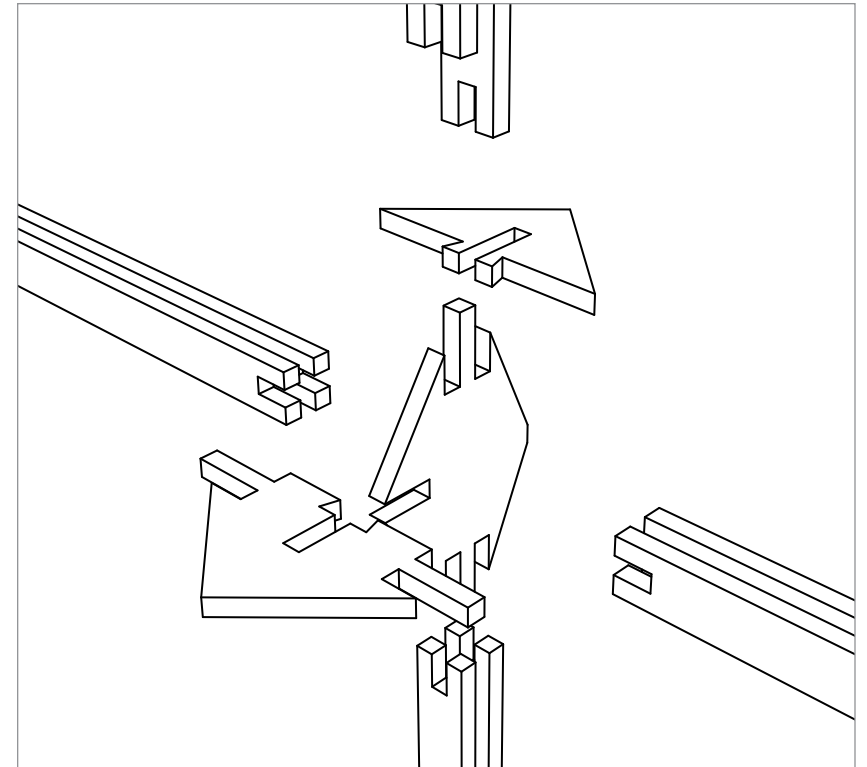
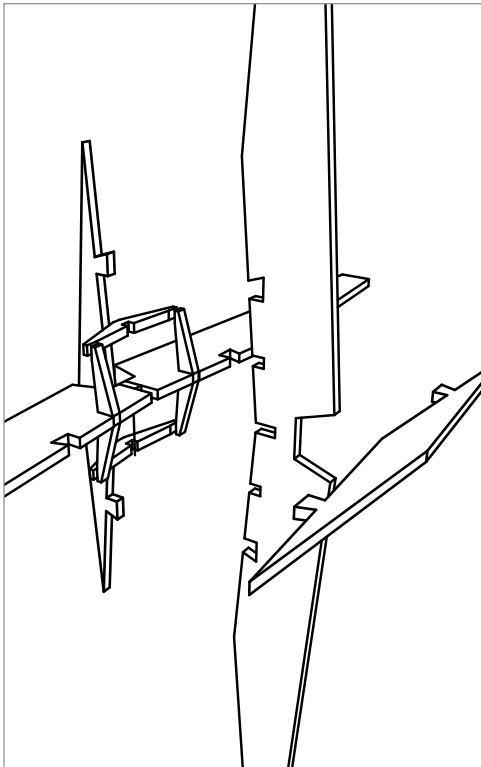
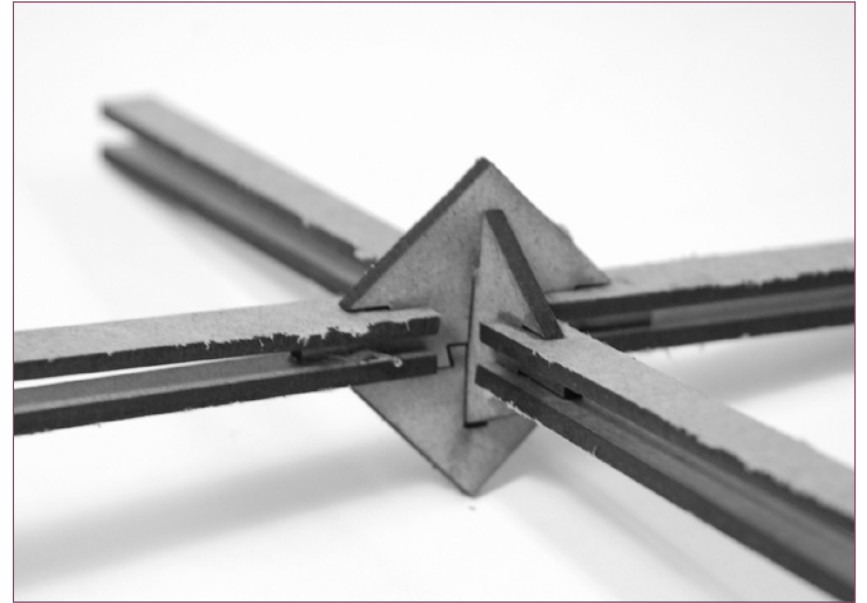
warm up

this segment utilized dovetail joints to lock the 'tails' to the 'knuckle'



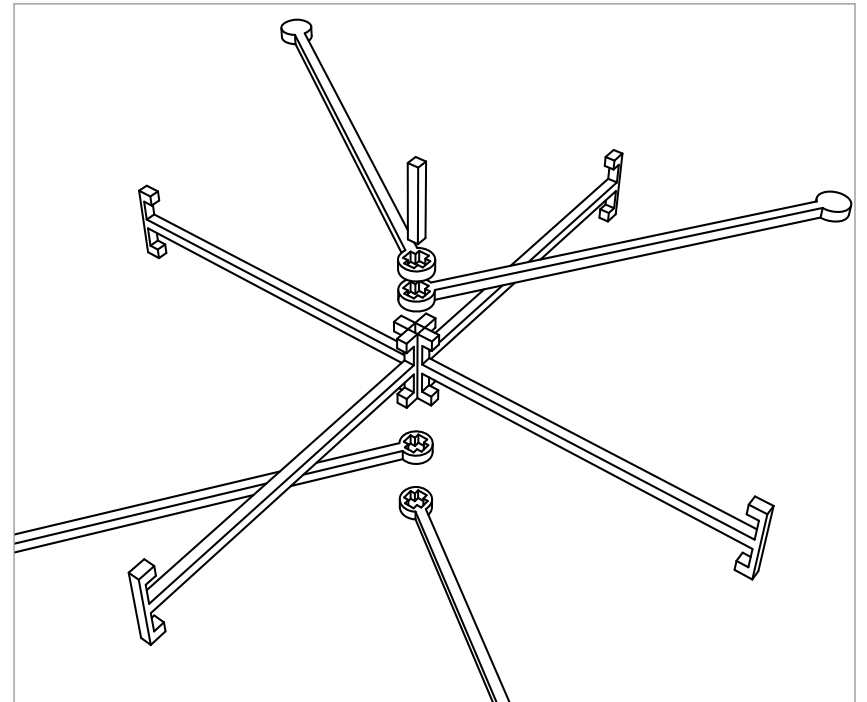
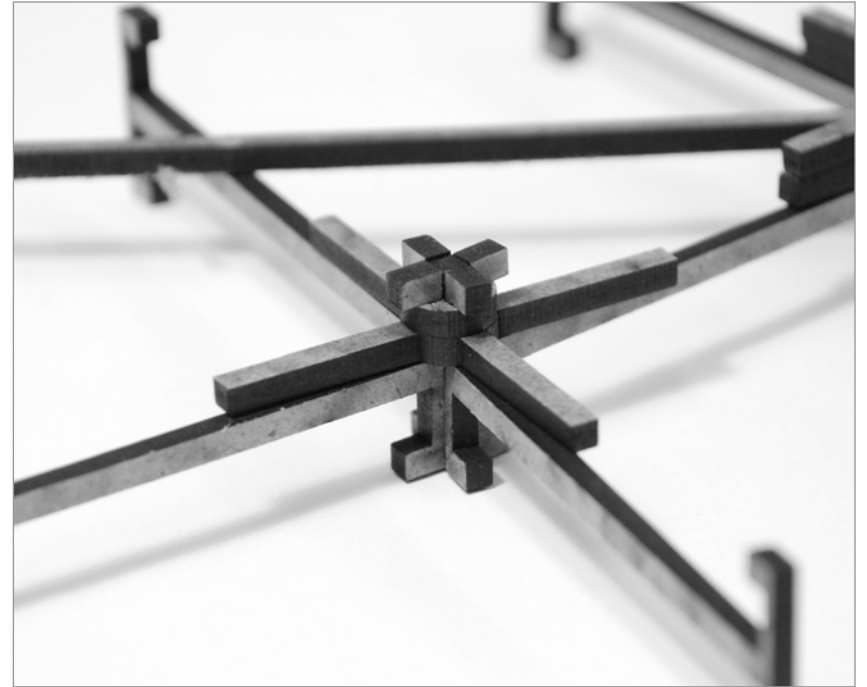
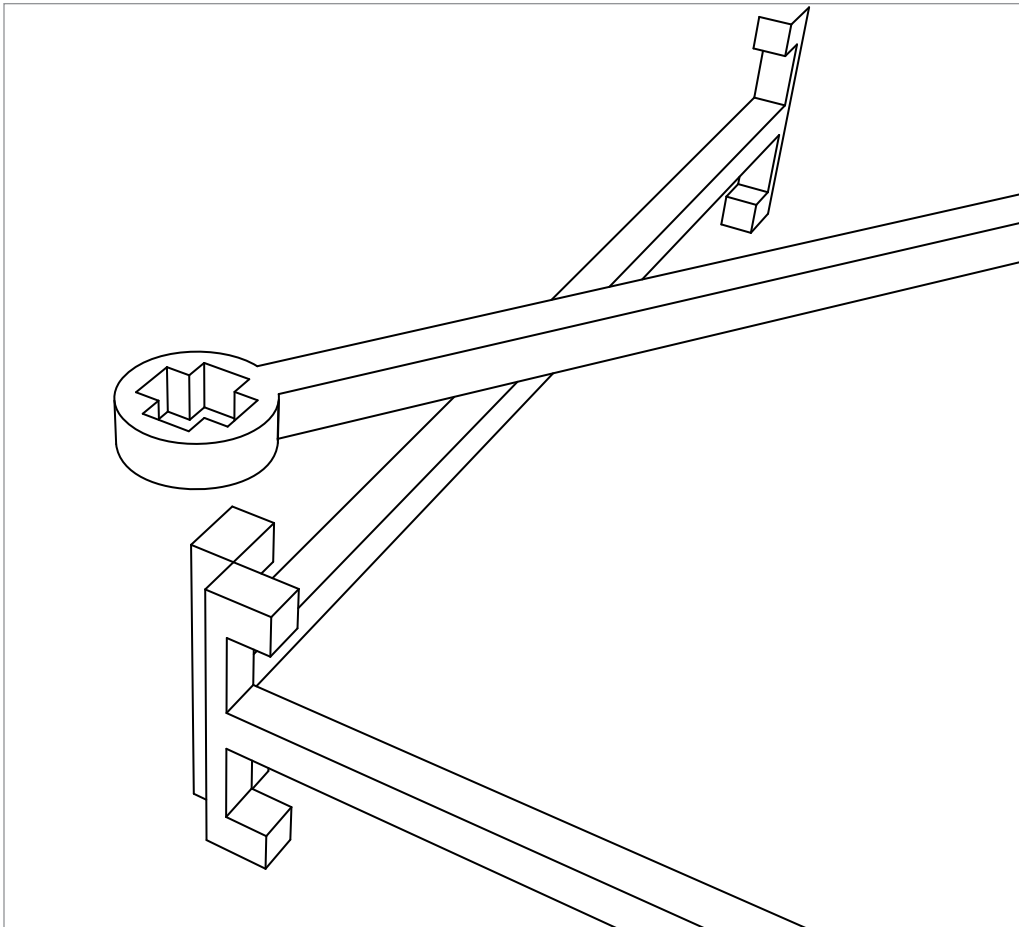
ideal joint

the first approach to this assignment, was to create a joint that used the same dovetail connection to lock together the ribs of the wall system, as well as the flanges that clip the wall panel in place. while this unit held together nicely, it is not easily scalable to the entire wall, as the major structural elements have to run continuous over the course of the wall. the second attempt tried to address this problem by making the joint that connects both modular frame systems as well as infill attachments. this version proved to be structurally unstable, and did not make any provision for cross-bracing, and the bridle joint at the knuckle posed a problem when addressing edge conditions. while it appears to work well for the field condition, it was scrapped for a version that can adapt to edge and field positions.



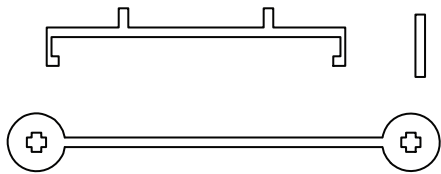
ideal joint

the final joint provides structural stability in multiple directions through crossbracing and is easily adaptable to both field and edge conditions. Each element in the assembly is modular and is discontinuous across the wall. The joint requires careful assembly and when the final post is put in place, then entire joint is locked together. It only relies on friction to hold the final piece in the assembly, but this piece is not subjected to friction forces.

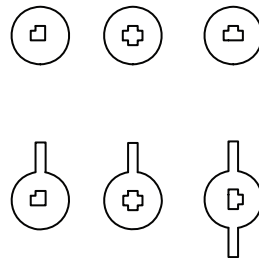
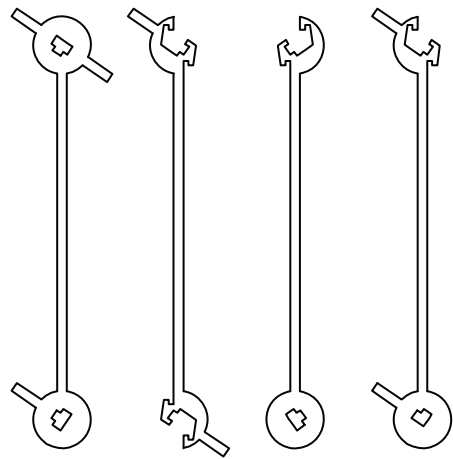


the real joint

while it was anticipated that this joint would require minimal variation across the wall, it became immediately apparent that few elements from the sixteen joints are reusable. A host of variations of the joint, cross bracing, pin and even the frames was required to produce the sixteen separate conditions in the nine-panel wall.



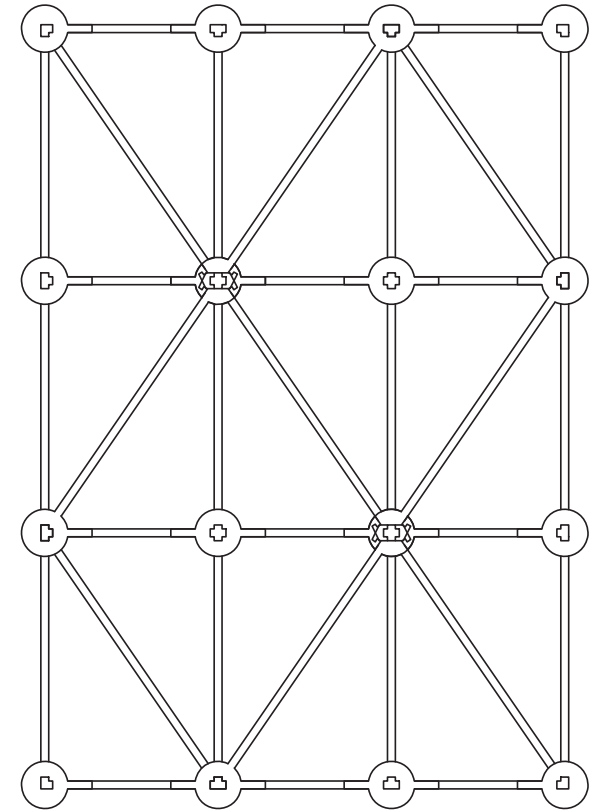
the ideal joint was made of only 3 different elements, the frame, the crossbracing and the pin



The crossbracing also required a joint in order to make the structure continuous, but also modular. Because of the various edge conditions, there were several variations on the most simple connection element.

Rather than customize the frame in every location where there was no crossbracing connection, it became apparent that additional blocking was necessary to fill out and make the joint standardized.

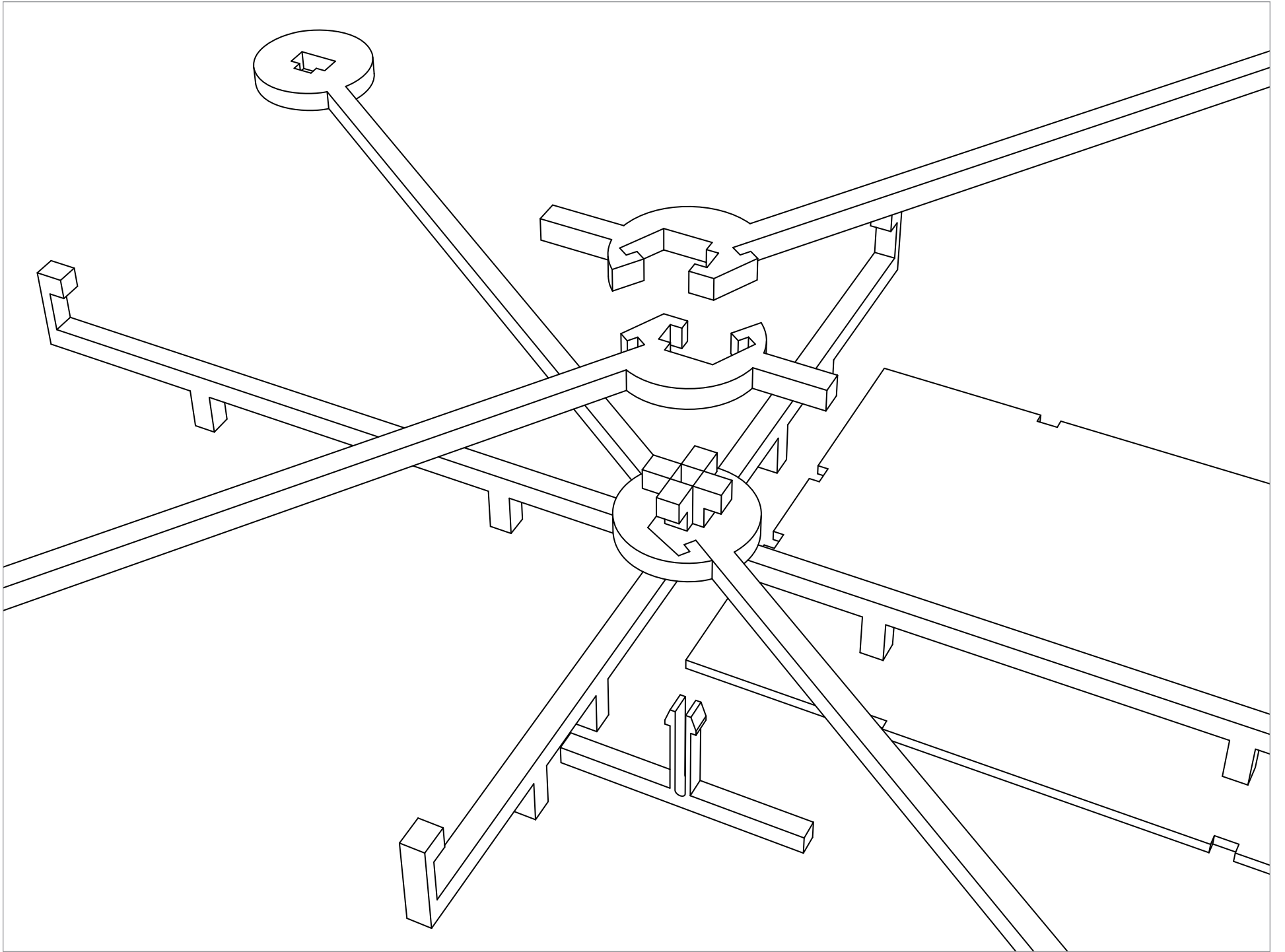
the pint was expanded to an 'L' to provide bracing across the wall, and in order to address both field and edge conditions, the pin varied between an L and a T. In addition the pin was redesigned to provide a locking connection between all the elements.

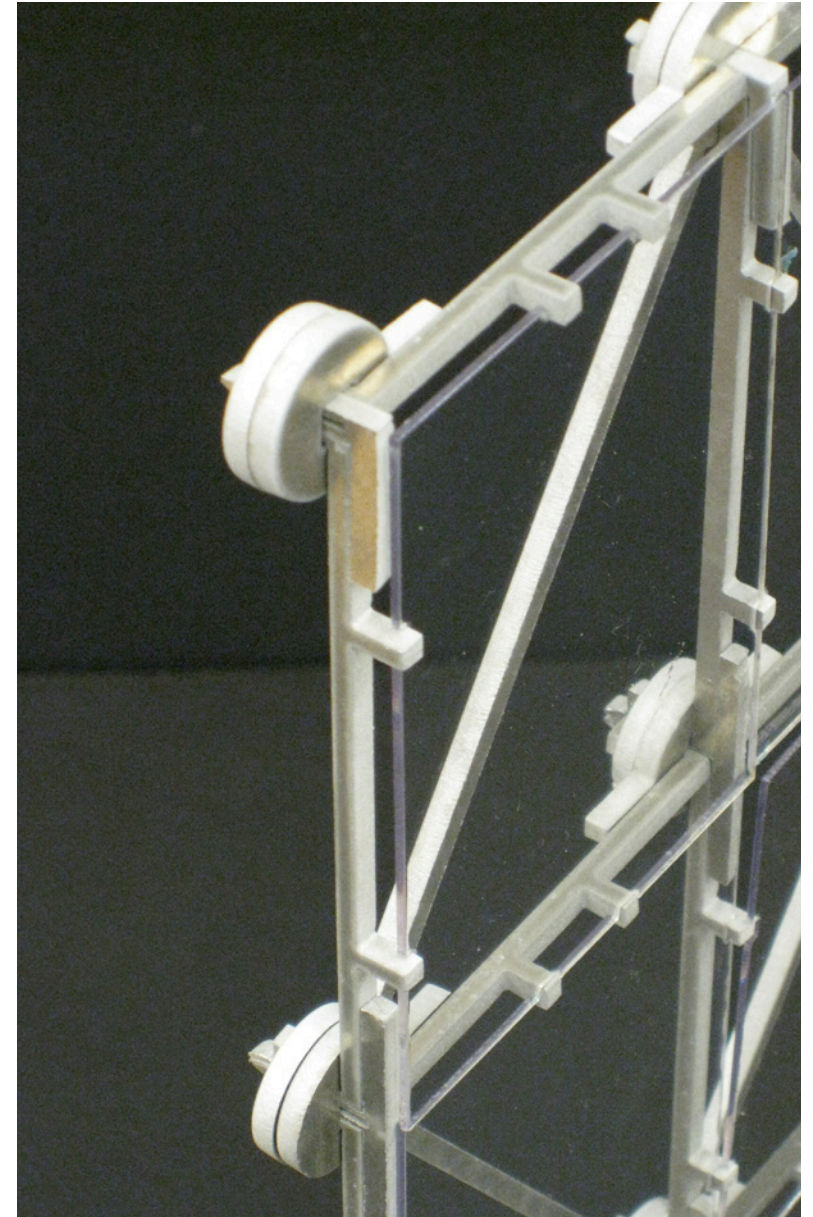
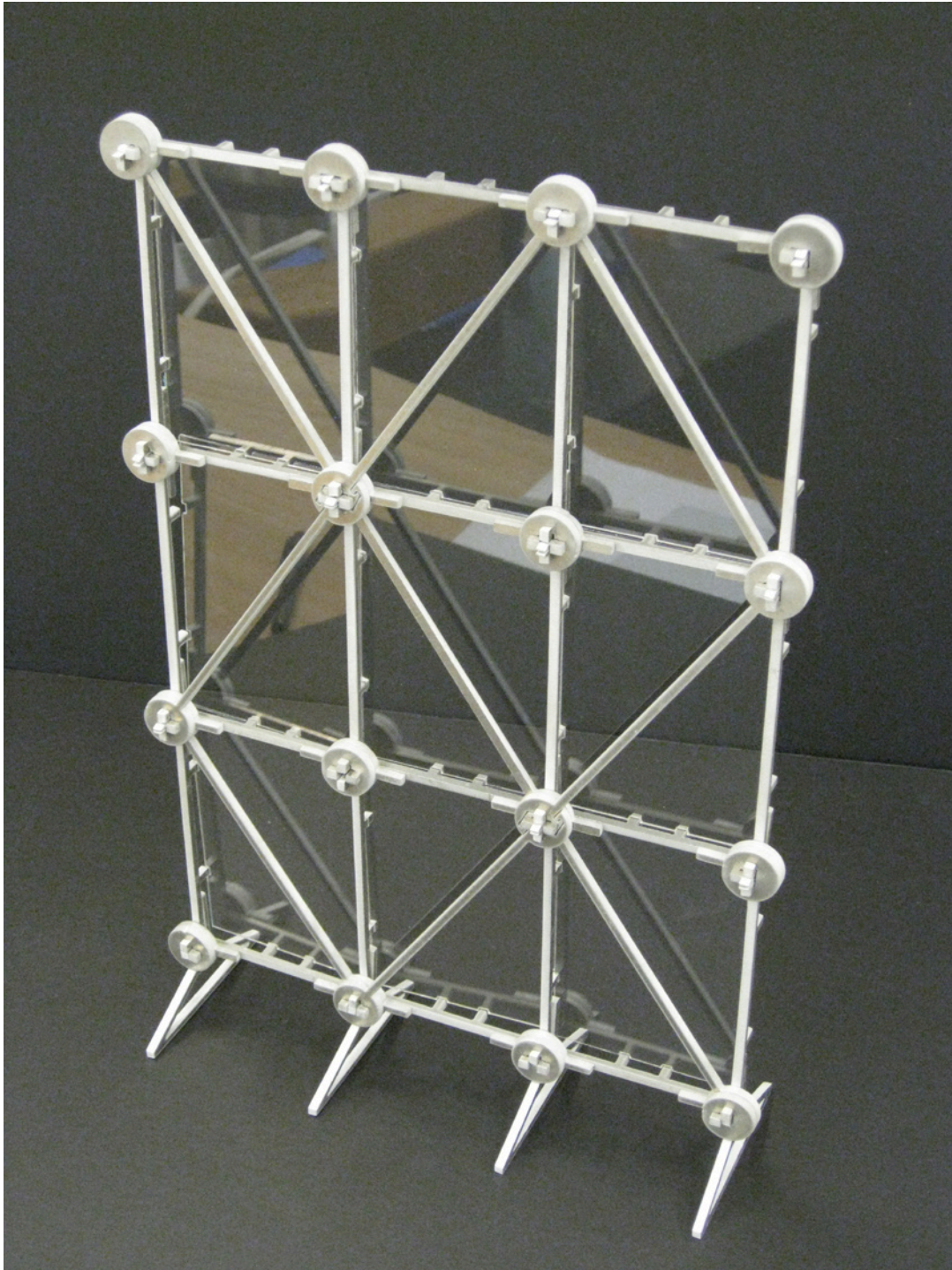


the final wall configuration



While the frame was the only element that remained relatively constant across the wall, to give the wall the correct proportions, two versions of the frame were necessary.





9 x 9 wall section