Building Tolerance: Design+Building with Reclaimed Wood

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Much of the finishes and details in a building are there for the purpose of hiding the gaps that exists at the intersections of materials and building elements (floors/walls/ceilings/roofs). Contemporary construction techniques often depend upon the layering of materials to accommodate material diversity. This allows for a layering of tolerances and precision as well. The first layer (a frame) is rough, the second layer (sheathing) is more precise, and the third layer (finish) is highly exact. This project examines this condition of tolerance and precision. It asks, how does the architect control tolerance? How can the architect design tolerance? These questions will inform strategies for material, construction, program, form and space.

The role of tolerance in architecture

Definition 1: an allowable amount of variation of a specified quantity, especially in the dimensions of a machine or part.

In the translation from drawing to built work, a design must accommodate reality: the imprecision of equipment, humans, materials, and site. The literal gaps given over to"reality" are what we understand as tolerances. Tolerance is the deviation we allow for human (and machine) error in installation and in the creation of the parts that create a building. As with statistics, tolerance is an allowable deviation from the precision of a drawing that will allow a building to "fit" together. While tolerances have improved with the industrialization and manufacture of materials, humans are still involved in the installation of components on site. The assembly of these components is fundamentally contingent on the various workers installing each piece of the building in the right location, the location being where it is intended to be on site, and each piece must be manufactured or cut to the dimensions in a drawing either off or on site. This is essentially impossible to control to perfection – in the field of mathematics, there are theorems that demonstrate that we will only ever be able to get infinitely close to zero. Despite our innovations with robotics and BIM technologies, we will only be able to reduce tolerances, not eliminate them.

Space is a fundamental tool for tolerating discrepancies and differences in architecture. Extra space allows for breathing room between two elements. Overlapping space enables coverage between varied elements. Could it be possible to learn deeper lessons on tolerance from architecture?

The Building Tolerance Pavilion is a site-specific installation constructed by students during a month-long workshop. The temporary pavilion examines the role of tolerance in architecture and in society. The structure is made of irregular, reclaimed wood and is positioned to create a forum for discussion. The exercise enables students to develop techniques for material tolerance while creating a space for social tolerance.

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Building Tolerance Pavilion from above

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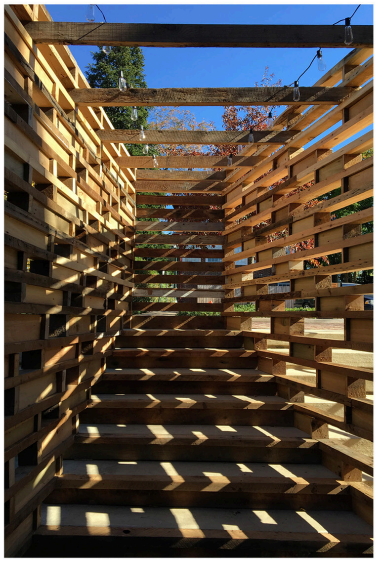
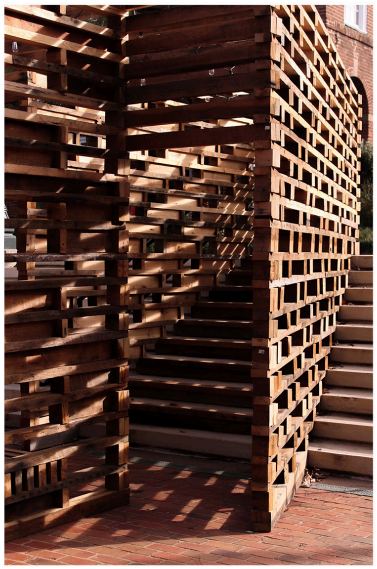
Building Tolerance Pavilion from upper terrace



Interior Forum of the pavilion

Wall stacking detail of reclaimed members



Pavilion entrance