Roof Structure
1. The roof structure utilizes small diameter timbers, culled from Arizona forests to reduce forest fires. These smaller logs are typically treated as a waste product and used for compost or firewood as they are too small for conventional lumber. This home demonstrates the embodied structural value of these logs. (LEED cr MR7)

2. Small dimensional timbers are used as carport columns and in the shade trellises.

3. Due to the under-utilization of round structural timbers, we fabricated our own steel joist hangers.
Structural logs are the main structure of the roof system and are aesthetically beautiful.
Steel joist hangers: The use of logs as structural forms is not traditional within mainstream construction practices in the United States. These joist hangers were custom made to hold and support many of the logs against the glulam beams.
All logs were designed to be slipped in at the walls. The purpose of this practice was to ensure that exposed exterior extensions of logs can be replaced in the future without affecting the interior structure.
Regular black steel tends to rust in short periods of time. In order to avoid this, a clear enamel coating was applied to the joists hangers.
A 36-foot glulam beam was lifted and mounted by hand with the help of 12 ASU students and other community members. These beams were designed to support structural logs in different areas.
Logs being supported by one of the glulam beams. The custom brackets made this possible as well as structurally sound.
The use of mechanical equipment was limited due to budget constraints. Most of the lifting and handling of materials was done by ASU students and Youth Build members.
Utilizing dimensional logs as the main structure for this residence helped to eliminate the need of trusses or any other prefabricated structural systems. These logs were salvaged from forest thinning for fire control in the State of Arizona.