

THE MIZER'S RUIN



NATIVE EASTERN RED CEDAR

PROJECT OVERVIEW

The Mizer's Ruin is a 190 sq ft micro-dwelling that develops a low-carbon fabrication system that directly engages with local forestry production. The project results from a circular process of design-build activities that began with an inquiry into regional agricultural practices and field studies of local forestry that lead to grant funding from a state environmental agency. The project accommodated successive material explorations, speculative making, and in-the-field experience-based learning of lumber production. Knowledge from these activities was applied to innovative construction practices that focused on location-based mass-timber assembly systems. The Mizer's Ruin is a fully serviced building that provides year-round accommodation.

NATIVE TREES

The classification of eastern red cedar (*Juniperus Virginiana*) often blurs the boundaries between official and quasi-official terminology. The (*name redacted*) Conservation Roundtable states that it is a native tree that has always been a fixture on the (*name redacted*) landscape, while the USDA classifies it as native in most eastern states as well as many midwestern states. However, this distinction is often overlooked in the prevailing narrative within farming communities that blur the distinction and undermines the USDA guidelines. Often, the observation that it "behaves" like an invasive tree is enough to justify its removal. It is regularly extracted and dragged into slash piles that are burned when the weather is cold and wet.

Project Title: MIZER'S RUIN
Month/Year Completed: Sept. 2023
Role of Nominee (in the project): Design Build Faculty

Collaborators & Funding Sources Expenses:

- Statewide Non-profit Environmental Trust- \$34,000 total
- Two Consultants- 22 hours donated time
- 1 private contractor installing membrane roof- \$1500 total
- 1 private contractor for below grade plumbing install- \$800 total
- 1 volunteer site excavation, 3 days total
- 4 volunteers forestry and milling, 5 days total

Student Compensation:

- 32 students, 5 credit hour courses, 3400 hours total,
- 3 student workers total \$1500 as per university guidelines
- 1 student research assistant as per university guidelines



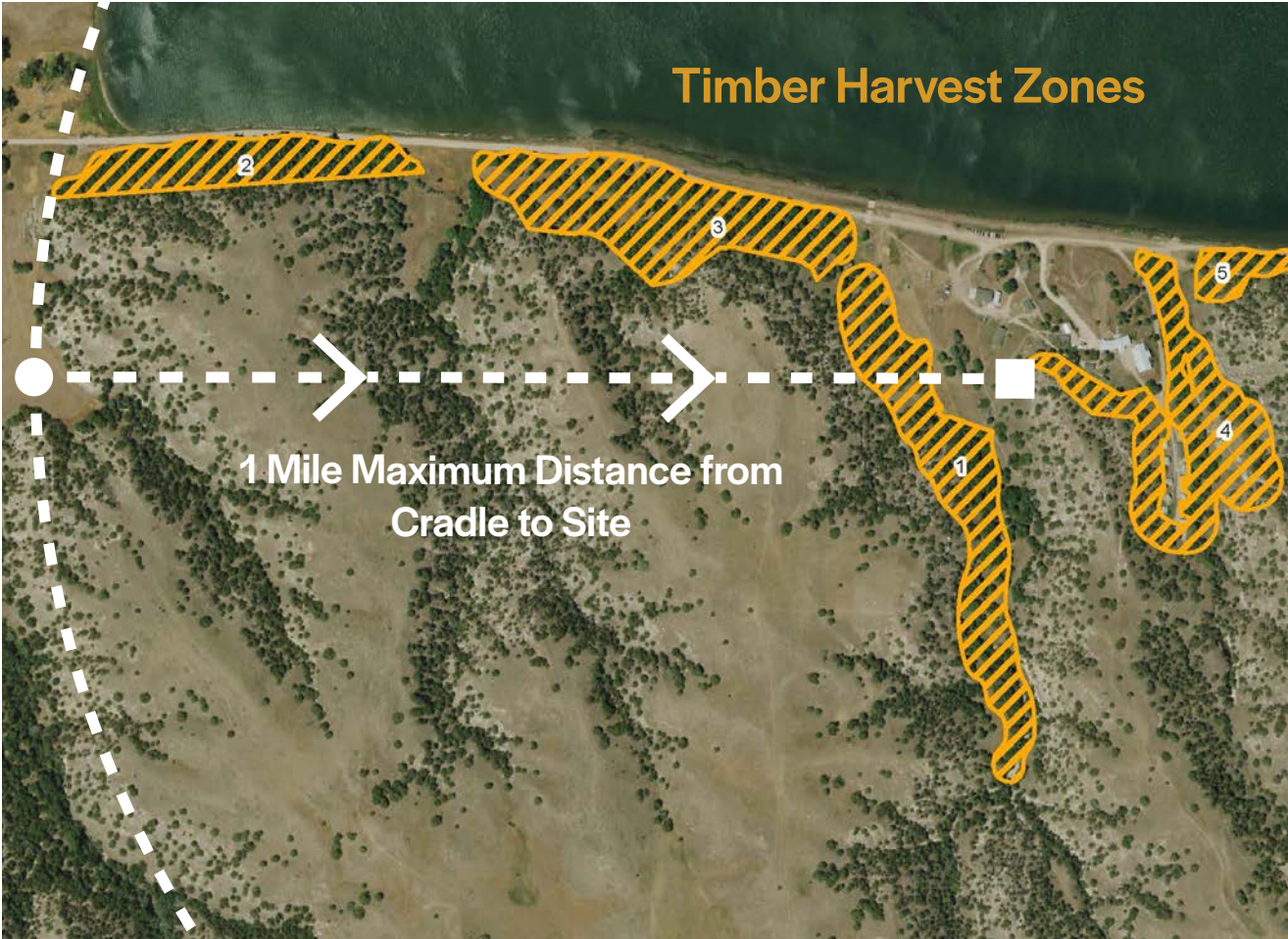
FOREST FIRE MITIGATION PLAN

The issue of forestry management is central to the constraints of the project. Our intervention began by working with the state forestry service to establish new terms for their Forest Stewardship Plan in the canyons adjacent to our site.

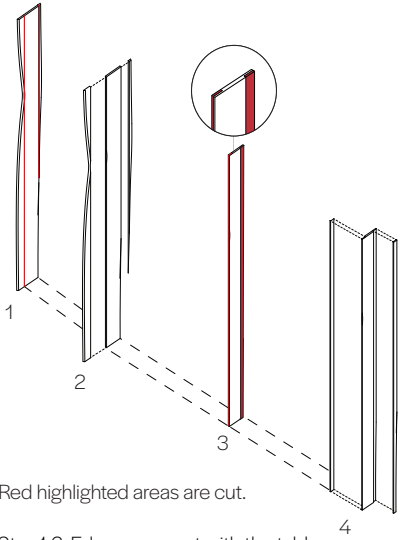
“The goal of this management is to provide sawlogs for milling and constructionprescriptions will aim to create safe, defensible space in case of wildfire.... For all stands: Harvest all large cedar (trees will be marked), limb, and pile with butt-ends towards easiest egress. Trees may be left whole after limbing, no further processing (i.e., cut-to-length) is required”.

This plan is unique to eastern red cedar and unusual for forestry harvesting practices generally. It provides for the selective extraction of saw logs that we determined to be useful for the primary structure and components of the interiors. In effect the extent of the plan geometry is determined by the maximum average length of usable sawlog (around 17') from which we could produce 10' lengths.

The extent of the forestry harvesting plan was also determined by the areas of the site most vulnerable to wildfires and also determined by the outer radius of all our timber supplies. It allowed us to explore a mass timber construction system constrained by a maximum radius of 1 mile from “cradle to the site”. This effectively meant that most of the stages 1-5 of the Whole Life Carbon Assessment were easily within walking distance of our building.



EASTERN RED CEDAR TREE CUTTINGS

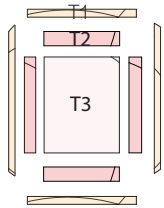
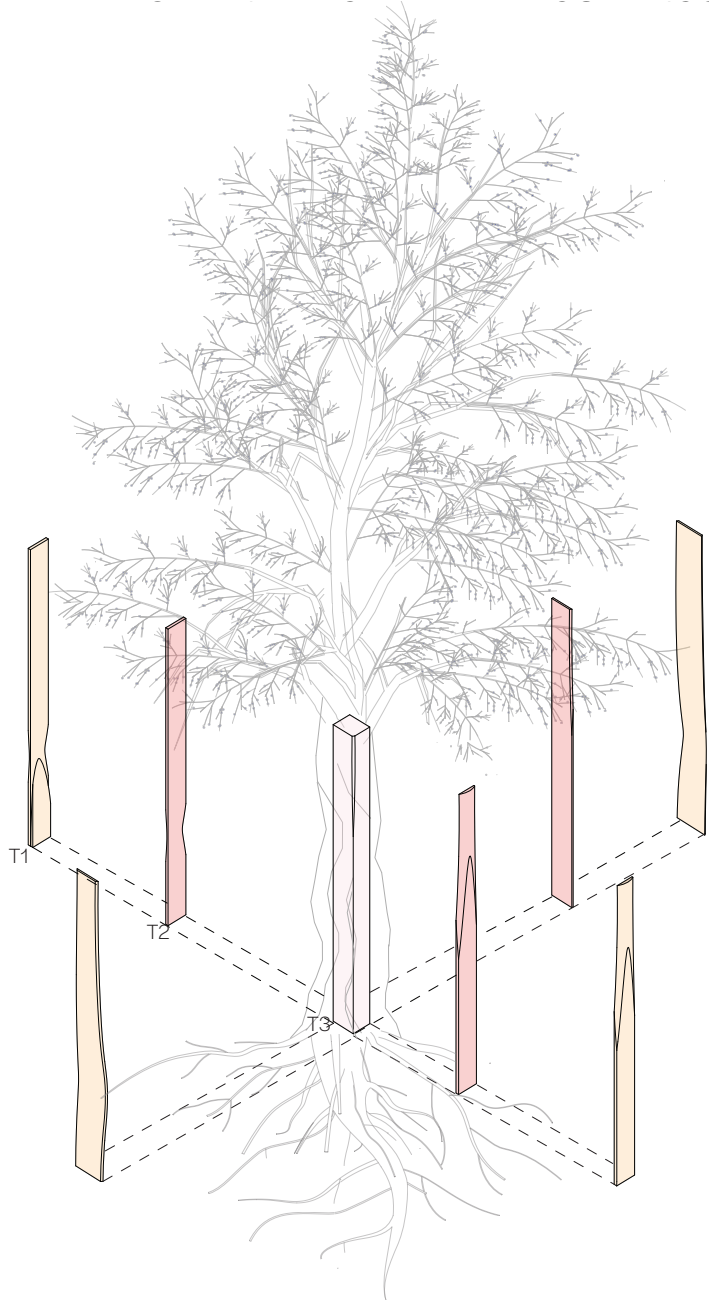


Red highlighted areas are cut.

Step1-2: Edges were cut with the table saw leaving a 3"-6" wood plank.

Step 3-4: The table saw was used to cut half laps joints.

Step 3-4: The table saw was used to cut half laps joints.



Top view

Step 1: The tree was rotated and cut to remove the first layer (Bark).

Step2: A 2-3 inch slab was created from this cut

Step 3: Lastly another cut was made to meet the logs dimension

Cedar Usage

- T3. Beams, Wall timbers & Chimney
- T2. Framing, Cielings, Floor, & Door frame.
- T1. Cabinets, Door lamellae, & Wall slats

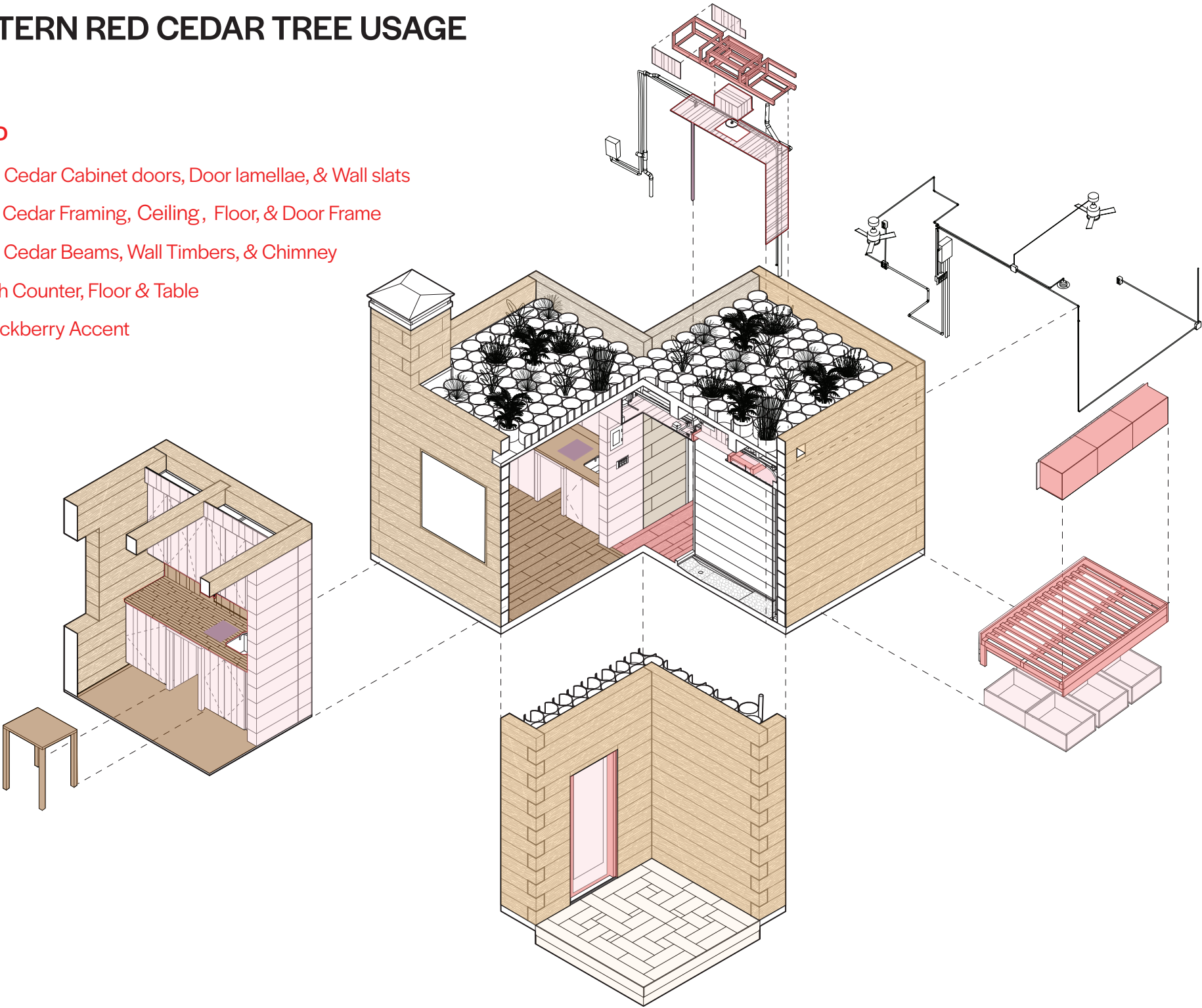
ON-SITE PROCESSING



EASTERN RED CEDAR TREE USAGE

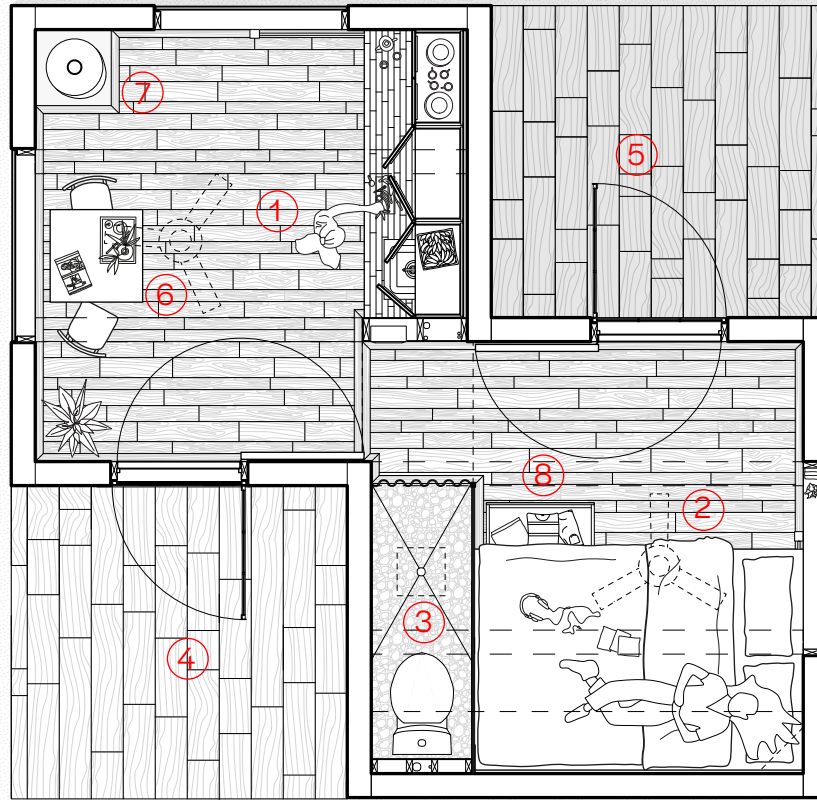
LEGEND

- T1 Cedar Cabinet doors, Door lamellae, & Wall slats
- T2 Cedar Framing, Ceiling, Floor, & Door Frame
- T3 Cedar Beams, Wall Timbers, & Chimney
- Ash Counter, Floor & Table
- Hackberry Accent



LEGEND

- ① Kitchen
- ② Bedroom
- ③ Bathroom
- ④ South patio
- ⑤ North patio
- ⑥ Dining area
- ⑦ Wood stove
- ⑧ Pullout drawer



WALL FABRICATION AND ASSEMBLY



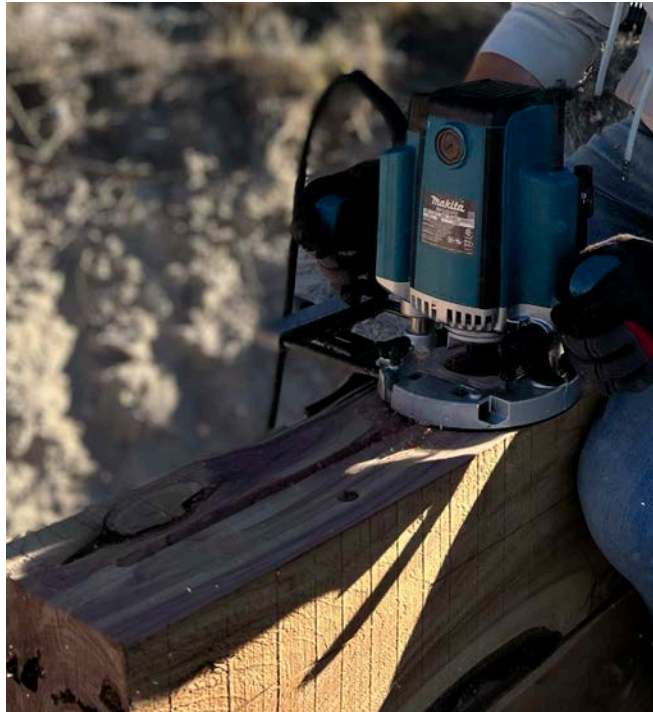
First course laid



Lintel course laid



Course cut to length



Spline routed



Wall assemblies completed

ROOF FABRICATION AND ASSEMBLY



Half lap cedar roof deck Installation



Organizing roof deck



Course fit roof deck



VACUUM FORMED CLT DOOR FABRICATION



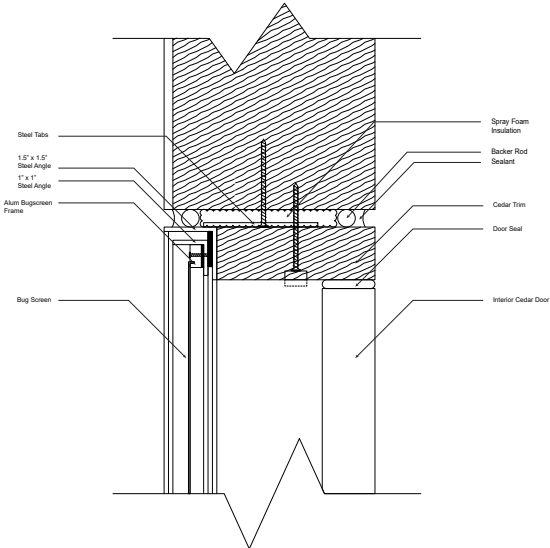
Door lamella glue up



Vaccum forming



Staining exterior door



Door jamb swing side



WINDOW FABRICATION AND INSTALLATION



Welding frame



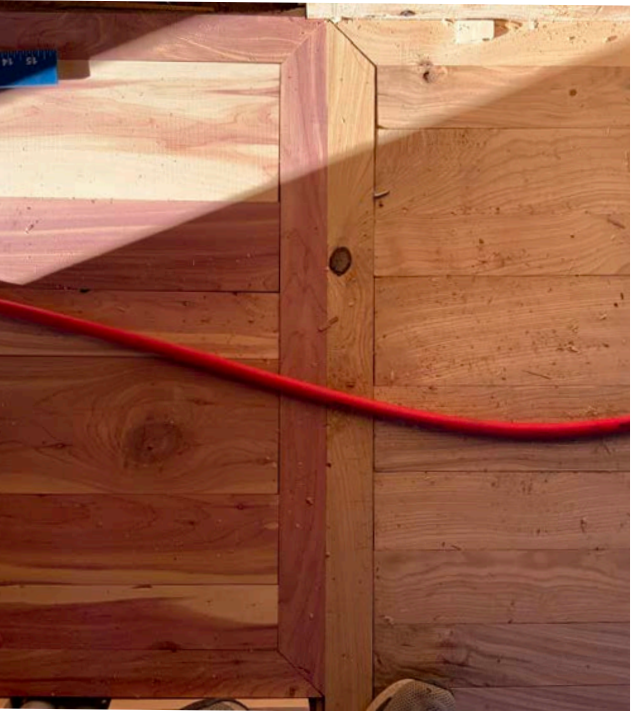
Installing window assembly



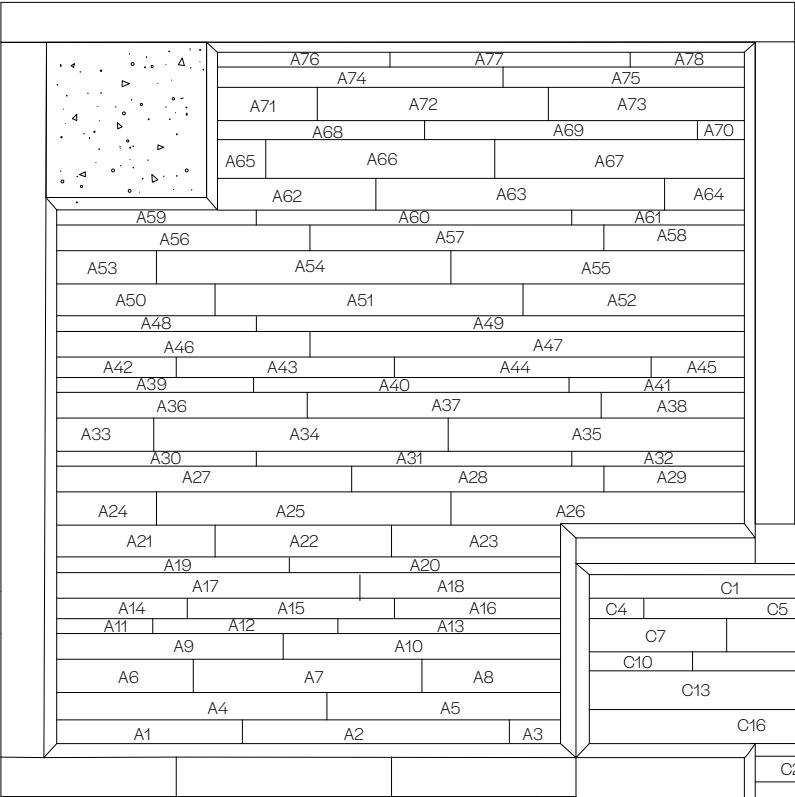
FLOOR FABRICATION AND INSTALLATION



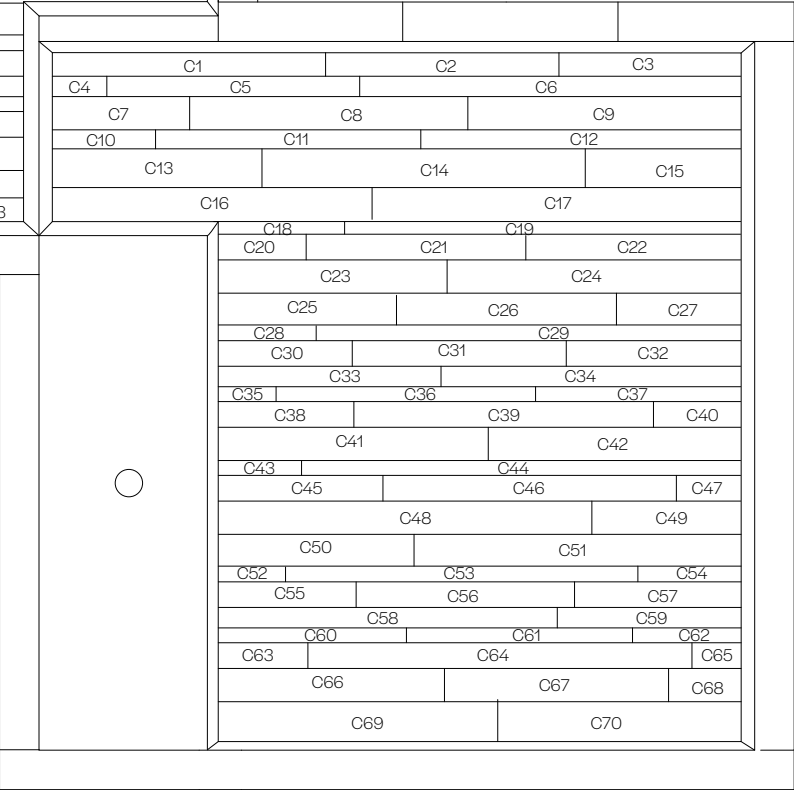
Cedar Floor



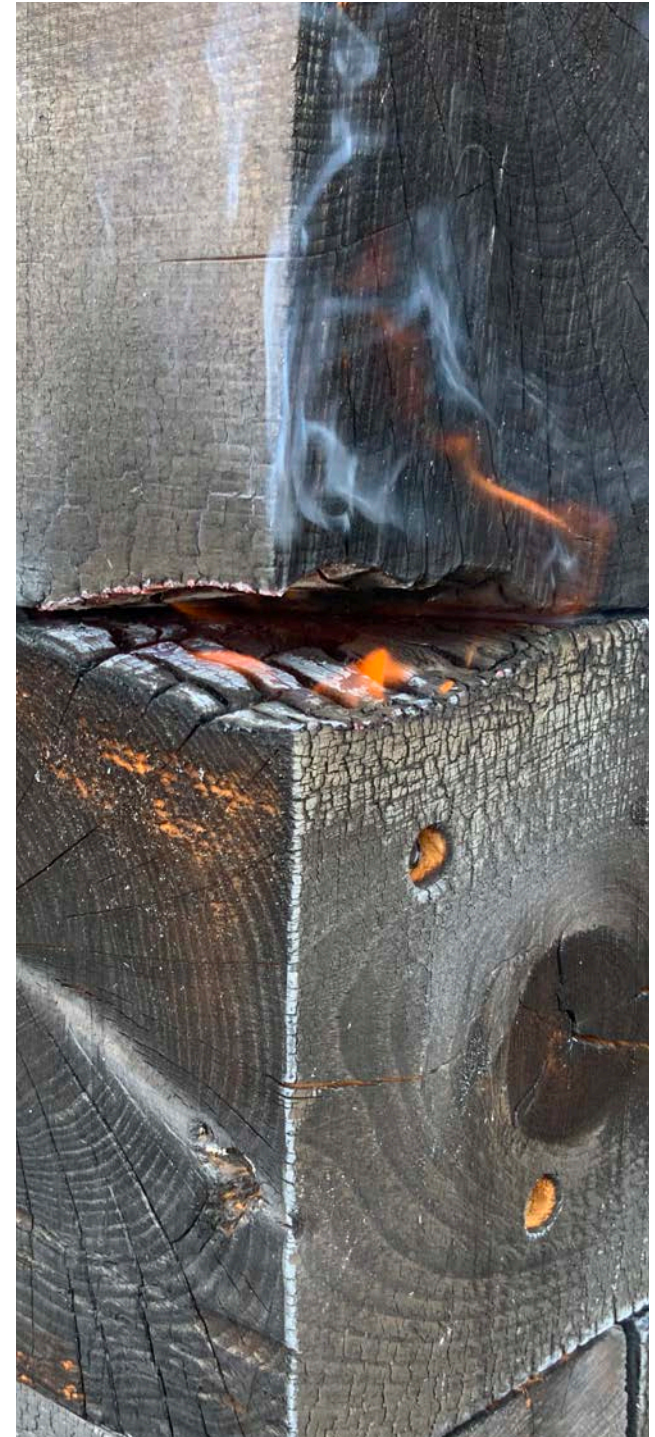
Cedar/Ash Interface



The floor constructed in two section: Section A is Ash, section C is Eastern Red Cedar. The floor boards were planned to 1.5 inches with tongue and groove connections. The plank widths vary in order to maximize the amount of each tree utilized.

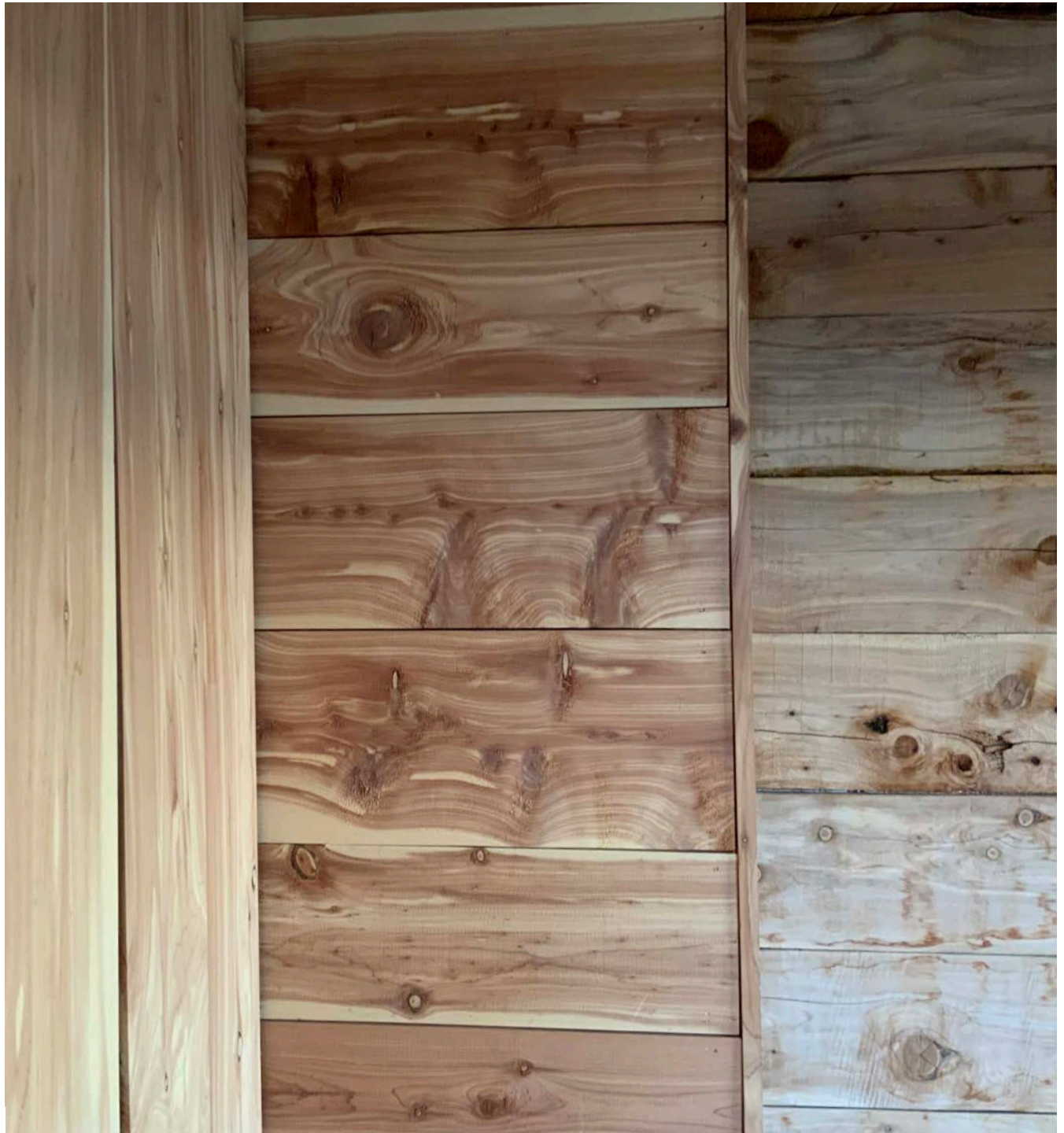


CHARRING THE EXTERIOR



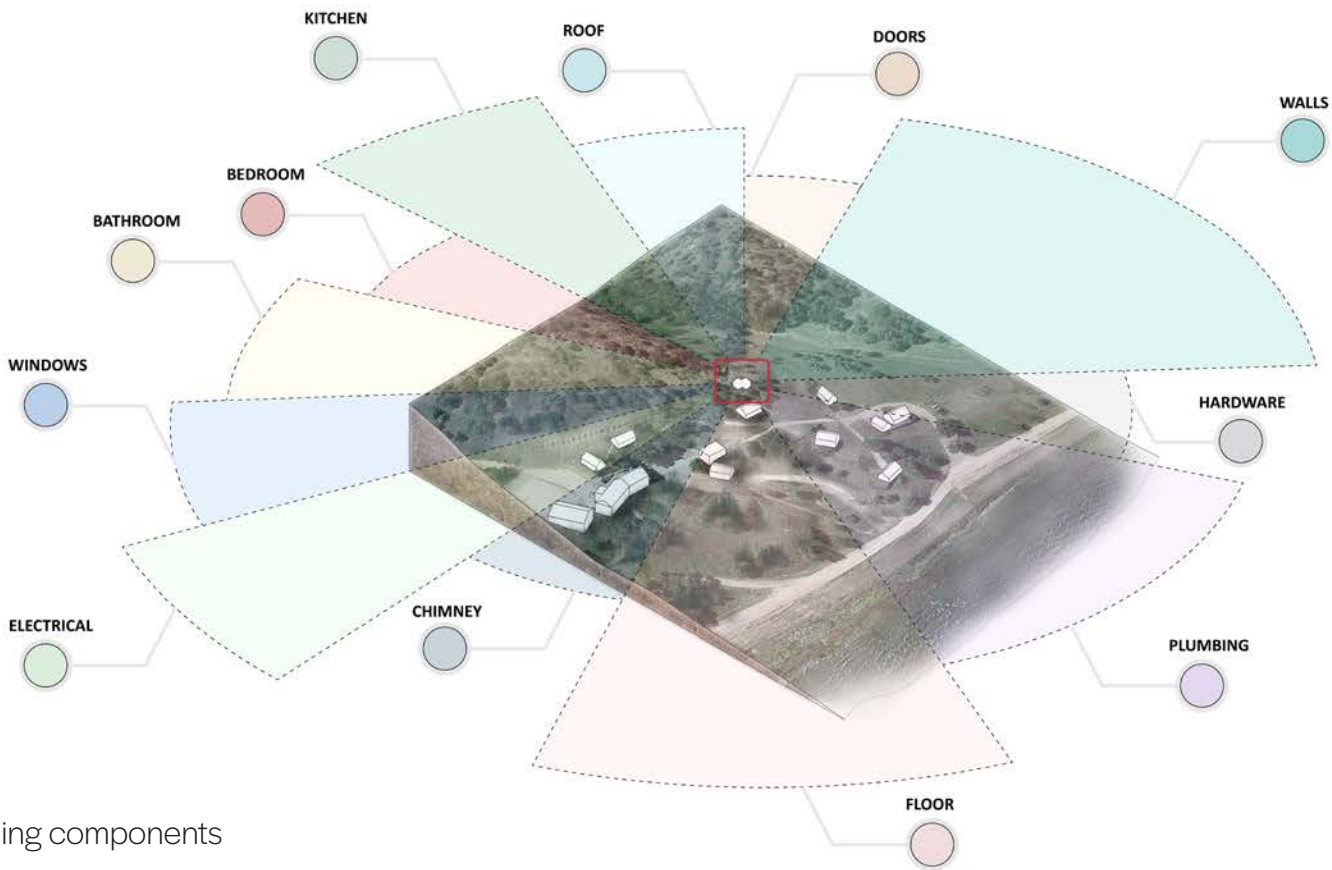




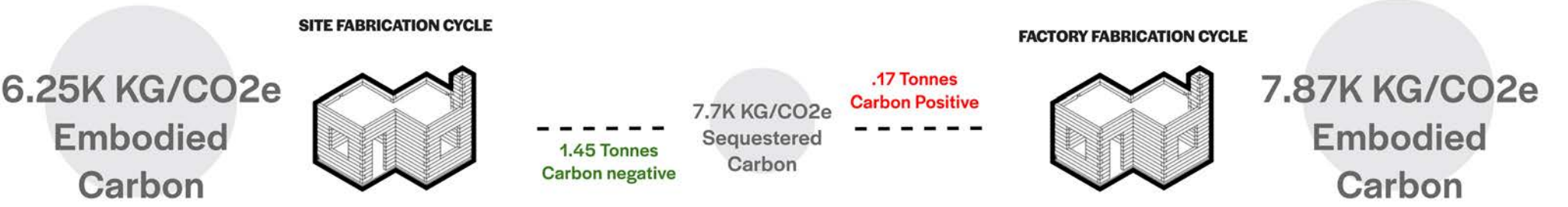




COMPARATIVE EMBODIED CARBON ANALYSIS



Volumes of all building components



Comparative study of embodied carbon (Site vs Factory Dowel Laminated Cycle Using online carbon auditing EC3)

COMPARATIVE ANALYSIS OF FABRICATION CYCLE

