



BLIND



BLIND is a 130 sq. ft “observation blind” for viewing the unique cohabitation behaviour of prairie dogs, burrowing owls and rattlesnakes. The building provides discreet observation of this rare example of multispecies cohabitation that continues to be threatened by the expansion of industrial agriculture. *BLIND* results from an ongoing design research studio that applies knowledge of local forestry production, low-carbon construction and biogenic material culture to architecture.

Prairie Dog Colonies and the Great Plains

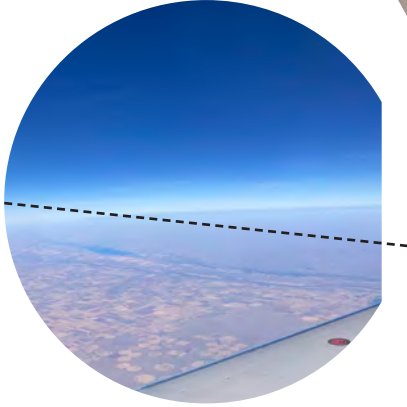


BLIND overlooks a small prairie dog “colony” that is made up of several “coteries” (families) that usually comprise one male and up to six related females. Prairie dogs are well-known for using a high-pitched bark to alert other prairie dogs of imminent danger.

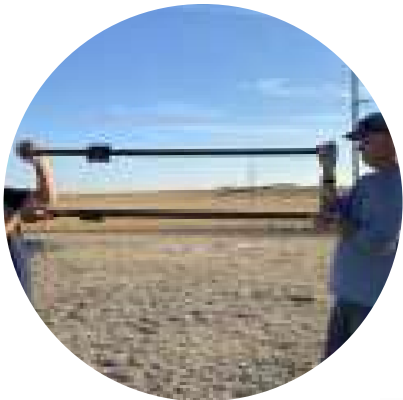
BLIND's position in the landscape allows visitors to experience elements of the Great Plains landscape. Viewed through the slotted windows, each viewshed places the colony in the foreground with the landscape of industrial corn production beyond. These landscapes are in sharp contrast to one another and allow visitors to experience the impact of industrial agriculture on the non-farming landscape of the Great Plains. A contrast that describes the context of prairie dog decline.

Preserved Wildlife Habitat

Industrial Agriculture

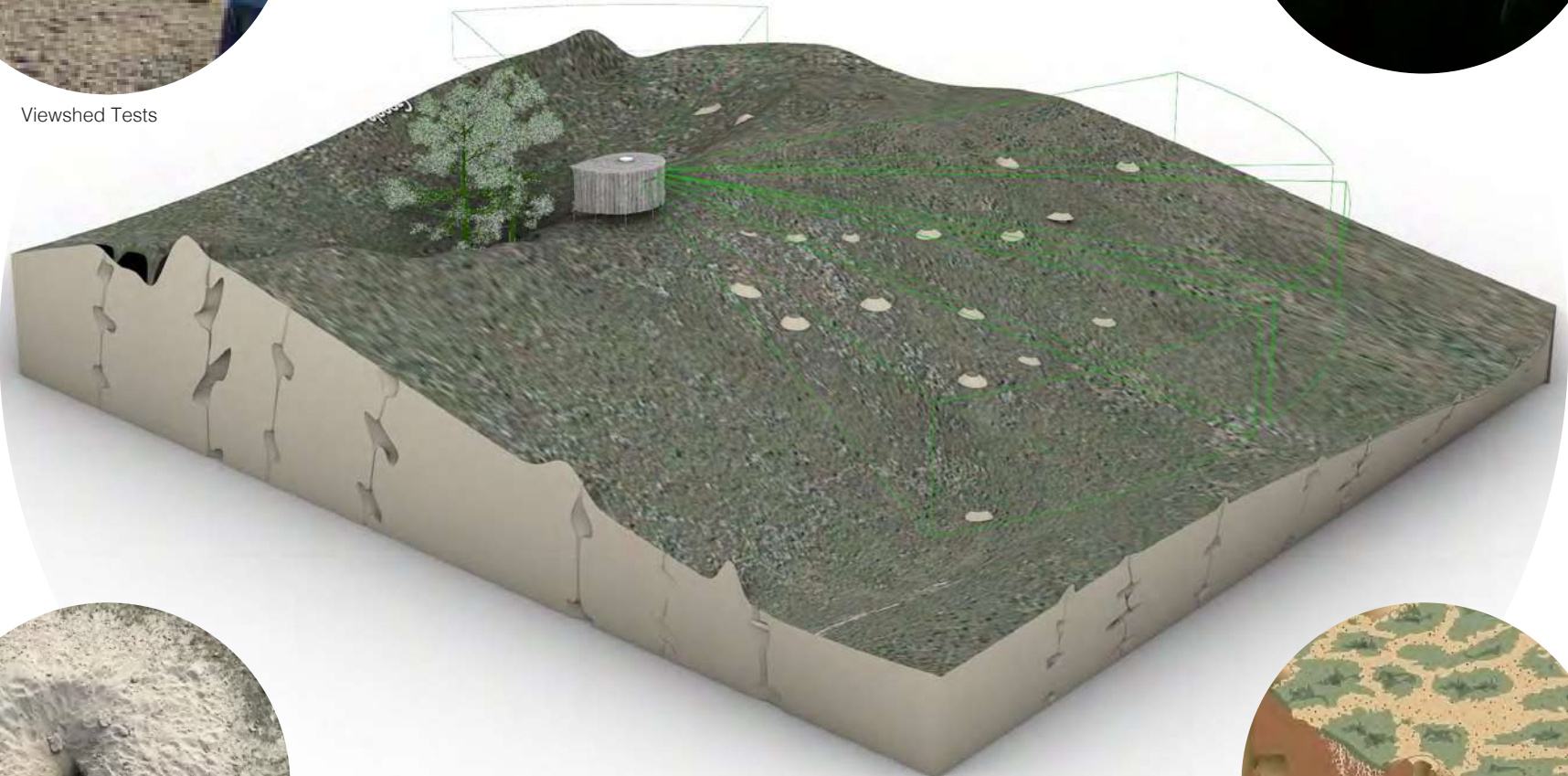


Prairie Dog Colonies and the Great Plains

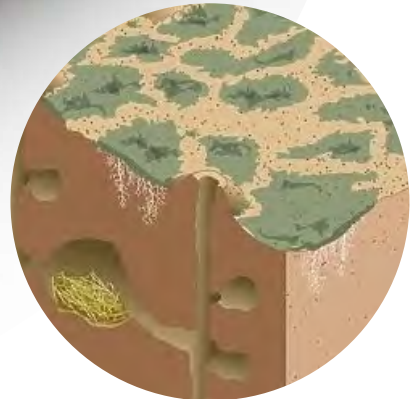


Viewshed Tests

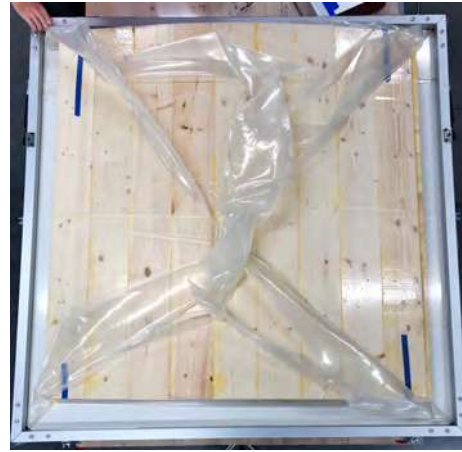
The Black-Tailed Prairie Dog is a keystone species, meaning it supports the life of 42 other species, including other “semi-fossorial” animals. Burrowing owls use the tunnels for protection and rattlesnakes for nesting and rearing their young. The decline in prairie dog populations can be attributed to humans’ lack of understanding of the vital role these species play in their ecosystem.



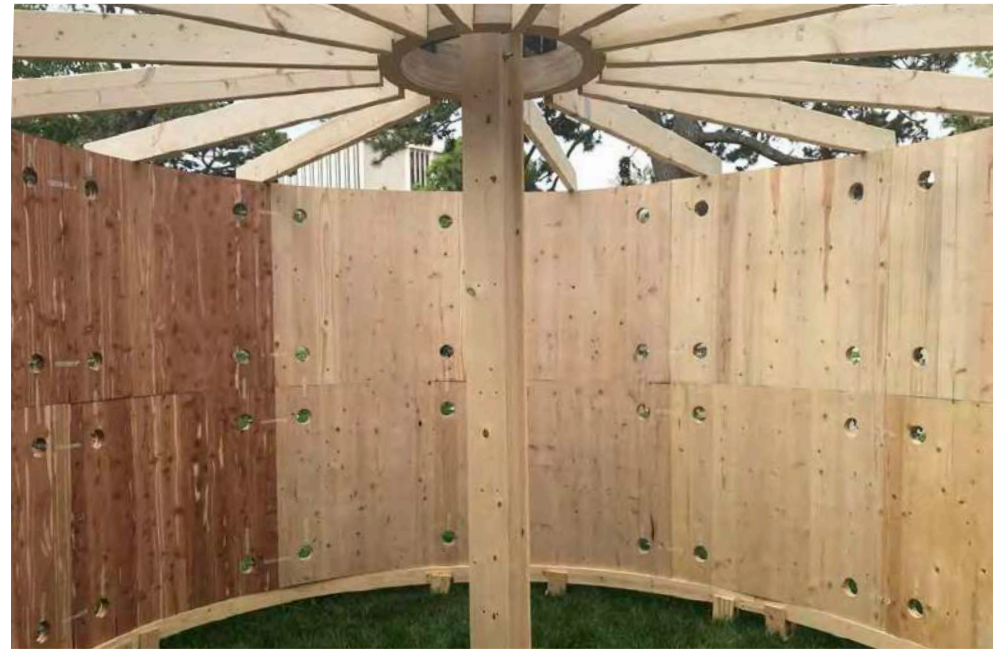
While Prairie Dog calls are still being researched, we know they can describe the type of predator and construct sentences describing its behavior, threat level and whether it is approaching from above or on the ground. Visiting *BLIND* aims to shift human perspectives through direct engagement and prevent further depletion of prairie dog populations.



Curved CLT - “Speculative Design” Research



The first phase of this project was a pure research exercise, during which students spent a semester studying and producing curved, vacuum-bonded CLT. This research demonstrates a “research through design” approach and explores each step of the CLT-making process, including timber sourcing, milling, layup, glueing, vacuum bending, and finishing.

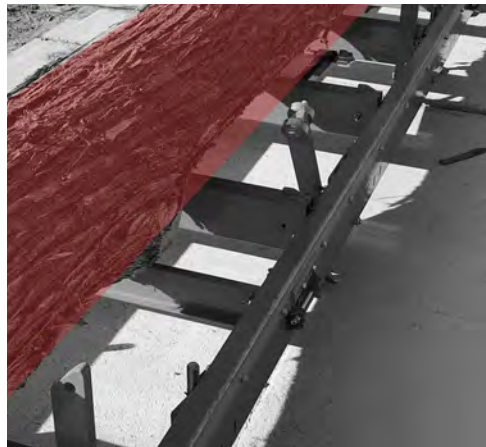


The early phases consisted of adaptive reprogramming, first as a gallery installation and then as an outdoor installation allowing us to engage potential clients and sites until we arrived at its current use. This nonlinear “speculative design” approach is at the center of *(redacted)* design build material culture. These latter-stage challenges included understanding the whole tree challenge, dry assembly tests, prefabrication constraints, and foundation design.

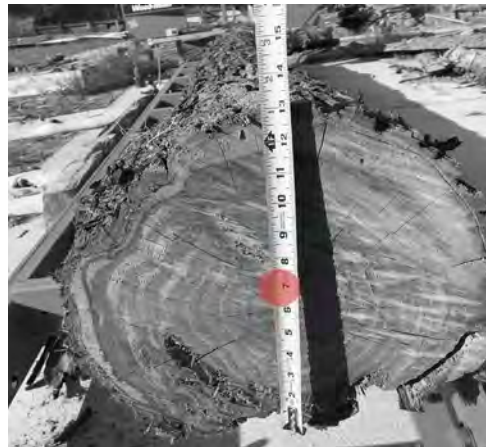
Milling – Whole Tree Challenges



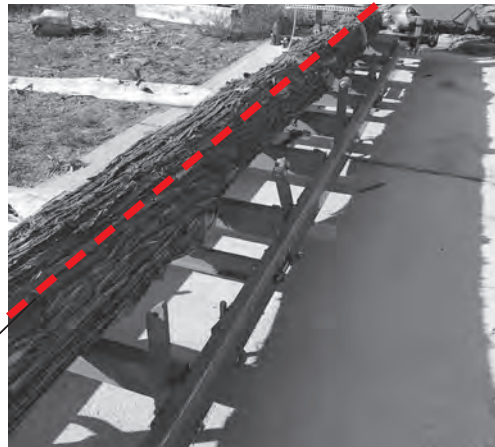
Cut log measuring 17 foot in length with maximum diameter of 14 inches and small diameter of 9



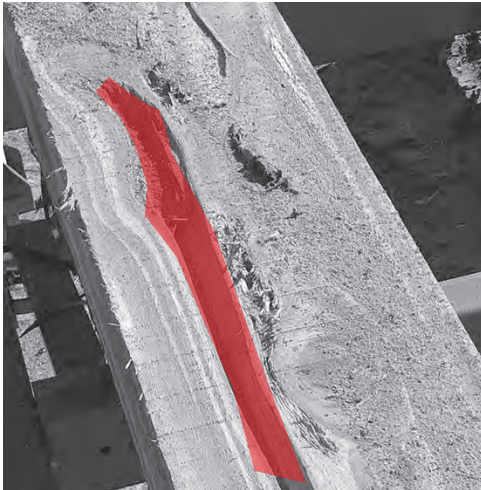
Log rolled onto basis of the mobile mill using a cant hook. Log braced against brackets and



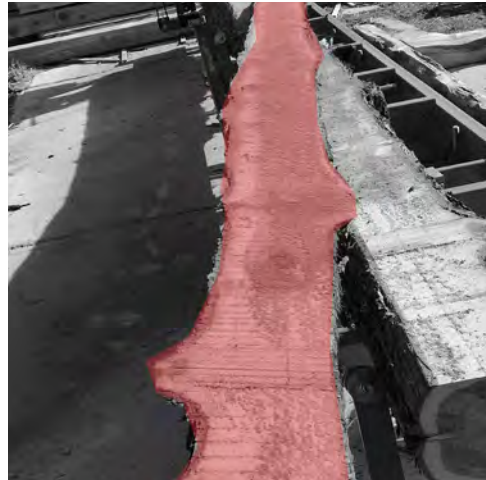
Establish center point of either end of the log.



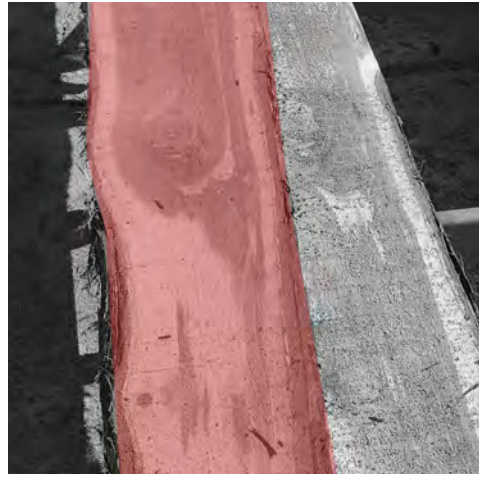
Using bottle jack elevate narrow end to establish horizontal center line.



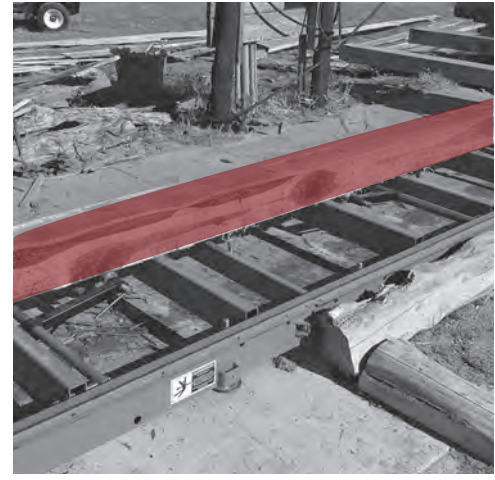
Identify areas where rot penetrates into the log



Cut 1 - Rough face with double live edge



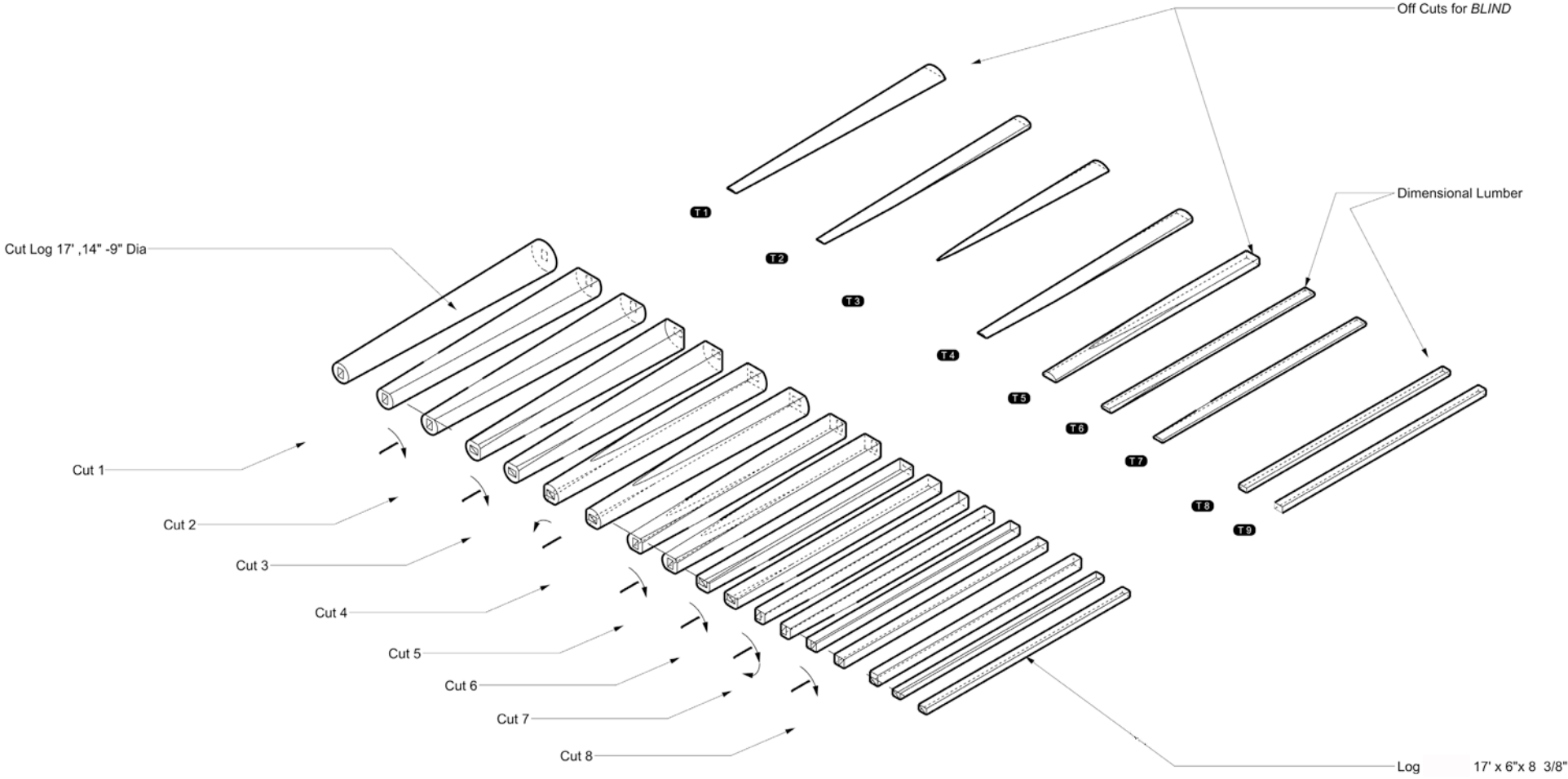
Cut 3 -Two cut faces with double live edge



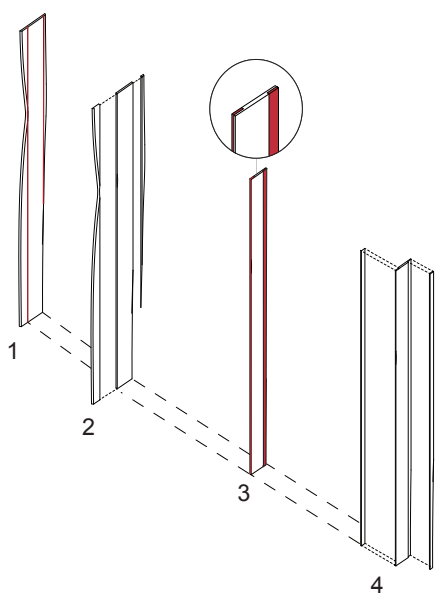
Final cut log - 17' x 6 x 8 & 3/8"

Site-milling procedures sought to maximize the amount of timber from each tree with a focus on off-cuts from the first milling phases. Locally harvested eastern red cedar trees were cut into 10' sections and cut with enough depth to produce a continuous strip with varying sectional profiles to create a rough-cut board and batten cladding. This meant cuts 1-4 would retain a round wood face with bark (exterior layer), while subsequent cuts (inner layer) would be an inch-thick board with two, one or no lived edge.

Milling – Whole Tree Challenges

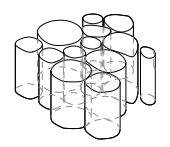


Milling – Whole Tree Challenges (updated)

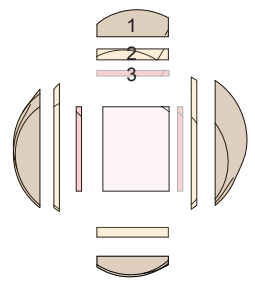
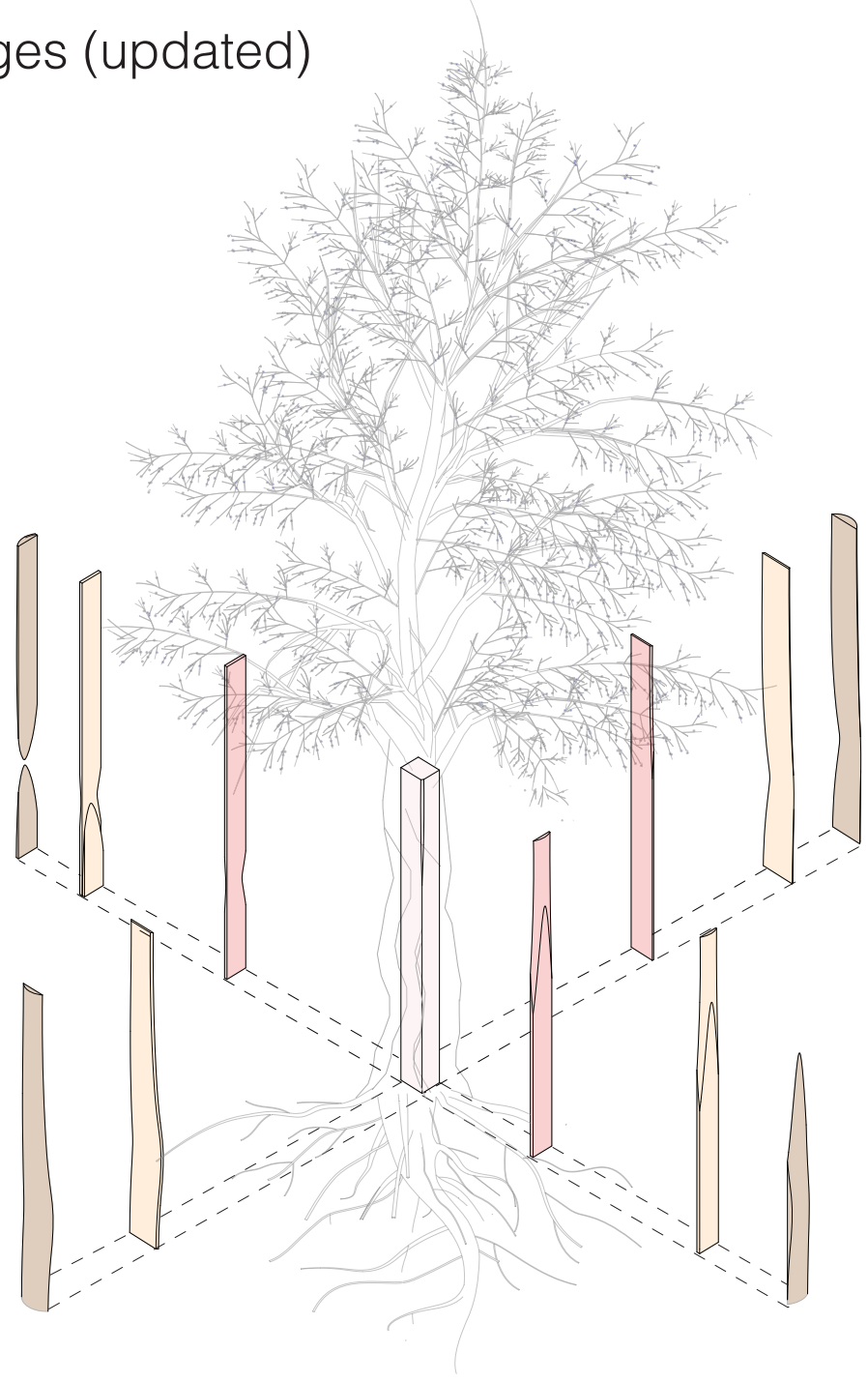


1- 4 live edge pieces cut & planed to make half flap doors for sliding door panels.

Other boards were used for curved CLT panels.



Smaller trees with "non-saw logs" of curved trunks cut into sections for parquet floor.

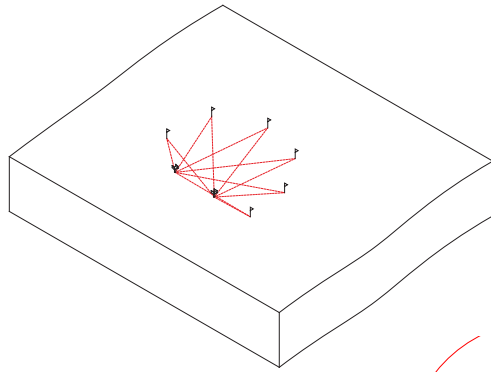


Typical cut sequence for *BLIND* elements

Key

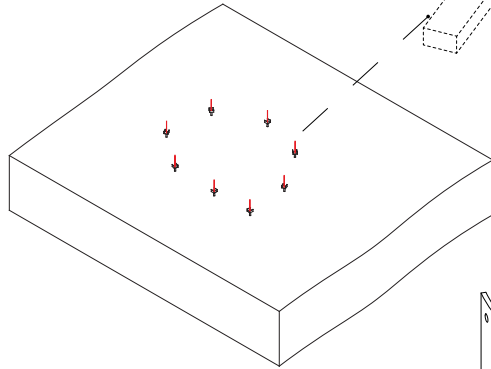
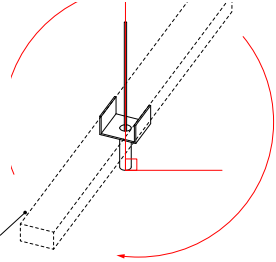
- Bark faced roundwood sections for *BLIND* cladding
- Straight/live edge 1" board for inner cladding
- Straight/live edge 1" board for the sliding door/trim etc
- Cants of high quality lumber. Used when needing thicker sections i.e Door frames, stiles and lintel.

Site Assembly



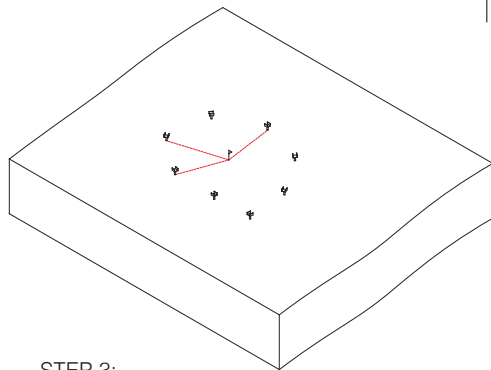
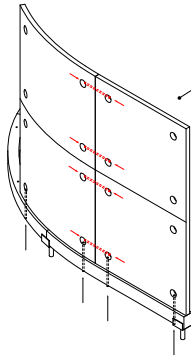
STEP 1:

Orient building footprint relative to site. Place first 2 piles and triangulate other piles from those 2. Mark with flags. See Assembly Plan Drawing for more details.



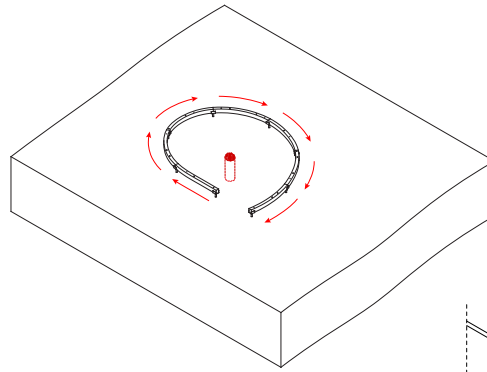
STEP 2:

Hammer rebar into pile locations as vertical leveling guide. Twist piles into ground, level horizontally relative to the highest elevation. See enlarged detail.



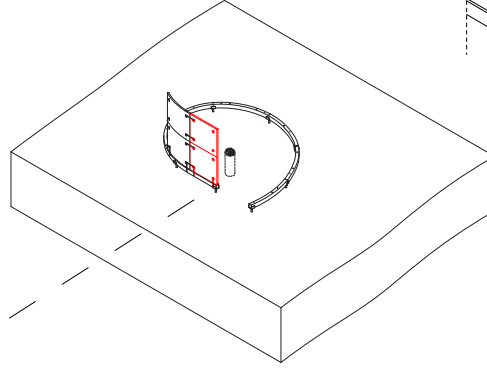
STEP 3:

Remove rebar. Locate column location using the same triangulation method as used for pile locations.



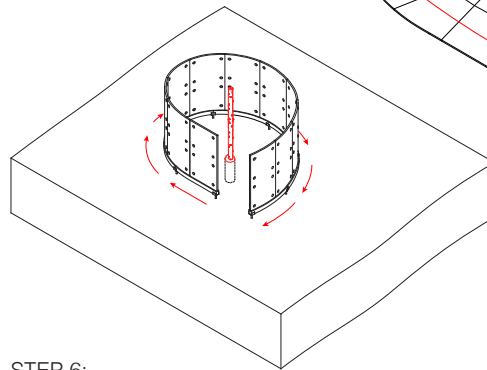
STEP 4:

Dig a 3' deep hole slightly larger than the diameter of the tree trunk column. Attach the beam segments to the piles using lag screws. Pre-drill holes into beams before inserting lag



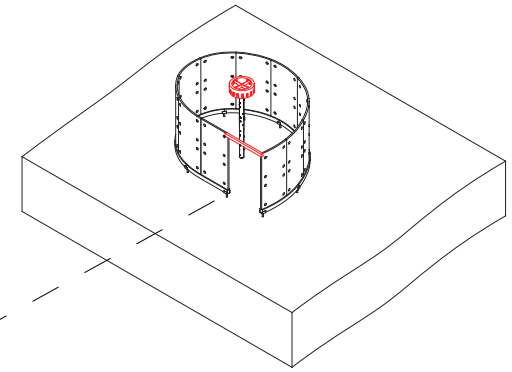
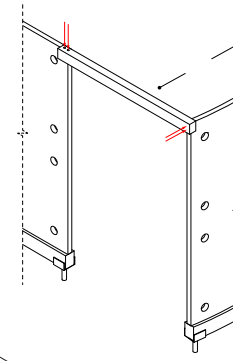
STEP 5:

Lift panel 1 into place, bolting it to beam A using 12" long threaded rods. Lift panel 2 into place, bolting it to panel 1 first, then to the foundation beam. See enlarged detail.



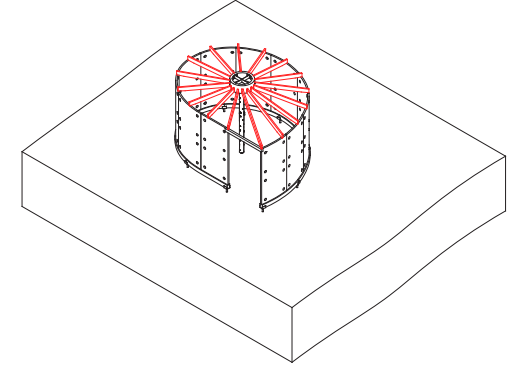
STEP 6:

Repeat panel assembly, remembering to bolt panel to panel before bolting panel to beam. Insert tree trunk into hole, cross-checking with triangulation measurements. Fill hole with



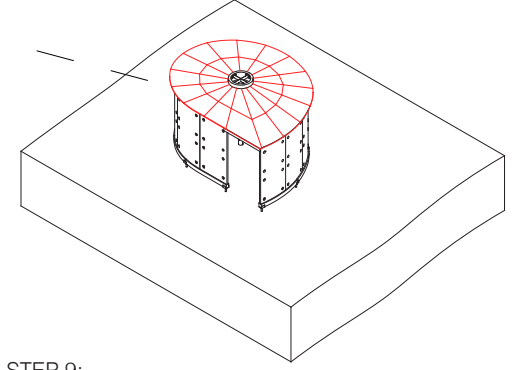
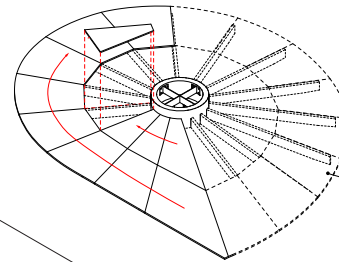
STEP 7:

Attach header, spanning panel 1 and 11. For connection to panel 1, use pre-drilled counter sunk holes for screws. For panel 11, screw directly through the face of the header. See enlarged detail. Lift oculus onto column and bolt together. This can occur before placing column in ground to assist bolting process.



STEP 8:

Starting at the longest rafter, attach rafters with screws from the inside of the oculus. Using lag screws, fix rafters to panels. Repeat this process, alternating sides of the roof structure so



STEP 9:

Screw plywood decking onto the rafters, starting from the outermost ring and working towards the center. See enlarged detail. Finish roof with water resistant membrane.

Site Plan - Prairie Dog Trail

Excavation to right side of the big tree working along the contours

Level area to allow for placement of stairs and retaining wall.

Prairie Dog Blind


Prairie Dog Burrows

Trail leading from visitors center passes underneath existing trees and below the ridge line from the North. This will conceal approach of visitors from prairie dogs.



Native grasses will be planted in this region to further conceal visitors from prairie dogs.

LEGEND

-  RETAINING WALL COMPONENT
-  STAIR
-  REGRADED PATH



Site Assembly



Site assembly phases began with establishing a site datum, accurately setting out the position of screw pile foundations using a rebar guide. This was followed by the shimming level of the glulam ground beam and assembling the CLT walls with threaded rod connectors. At the same time, set the round wood column, assembled the light-diffusing oculus, position rafters, and applied the ply roof deck, drip edge and membrane. Once the exterior was wrapped in Tyvek, the cladding could be applied in a board and batten arrangement over horizontal battens to allow for airflow. The final phases included cutting and inserting the steel slot window frames, hanging the sliding door and installing the log parquet flooring and removable window blocks.

Site Assembly



Project Info

Project Title: BLIND
 Month/Year Completed: July 2024
 Role of Nominee (in the project): Design Build Faculty

Collaborators & Funding Sources Expenses:

Financial Corporate donations from the timber industry, from state wildlife trust and USFS - \$27,000 total
 4 volunteer site excavation, 3 days total
 1 volunteer forestry and milling, two days total

Student Compensation:

Financial 4 student workers total \$1500 as per university guidelines

Credit

F21 4 students 15 hours/week for 16 weeks = 960 hours
 S 22 4 students, approximately 200 hours in total.
 F 22 Approx 10 student hours
 S23 4 students 15 hours/week for 16 weeks = 960 hours

Assessment

Assessment activities for each module occurred at meetings and reviews. These assessment points included presenting activities to clients, contractors, subcontractors, and instructors.

Module 01 25%
 Module 02 20%
 Module 03 40%
 Module 04 10%
 Attendance/Meetings 5%

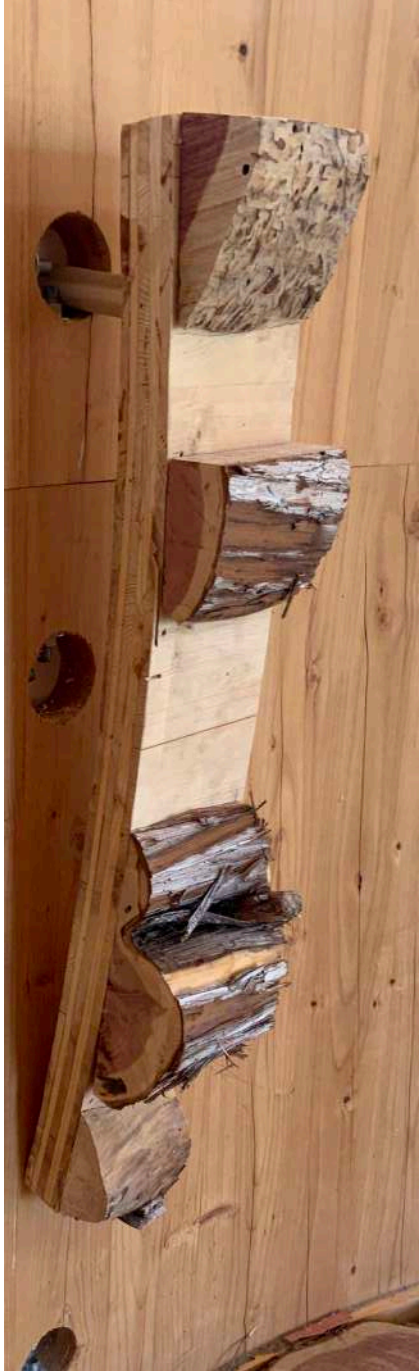
Each stage was evaluated regularly on a performance metric for group and individual responsibilities. Each student was assigned "Primary" and "Secondary" responsibilities.

P. 20 BLIND - Student Tasks		
Project Title	Reflected	Company
Project Manager	Reflected	
Primary Responsibilities	Task	Students
Door	Install Door	Josh/Austin
Dome	Plexi	Josh/Austin
Windows	Research into window construction and steel work Create construction drawings	Trever
Trail/Landscape	On site landscaping	Aly
	On site landscaping	Cara
	Create an updated site plan based on this research.	Trever
Electronic Recording Systems	Diagram of recording system/ Purchase list for grant application	
Floor	Complete floor installation/ Floor Beam creation	Trever
Documentation	Take and organize progress photos	

Secondary Responsibilities	Students
Drawing Set (Rhino)	Coordinating/ Gathering all drawings onto CD template and uploading PDF on Ondrive Cara
Research / Documentation	Coordinating/ Gathering all drawings onto one Rhino V 6 file and uploading PDF on Ondrive Coordinating/ Gathering all illustrations in single interactive PDF on research templates and uploading PDF on Ondrive Aly Timmerman
Schedule	Maintaining work schedule with online schedule. Trever
Costing/ Grant administration	Coordinating and communicating detailed individual site tasks and completion responsibilities. Maintaining regular Cost updates and coordination purchase through NSF Students Josh
Effort Reporting	Coordinating and student effort report and travel (arrangements and report) Josh
Meetings	Maintain meeting minutes and to do / purchase list Trever

Assessment Values	
Primary Responsibilities	Percentage
Construction and Fabrication Effort	20
Craft	20
Organization	10
Production of Content for "Secondary Responsibilities"	10
Initiative	10
Secondary Responsibilities	
Organizational Skills - Rigour of maintaining student responsibility	10
Contribution - Student content contribution to each responsibility	10
Clarity	5
Quality of Presentation	5
	100

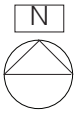
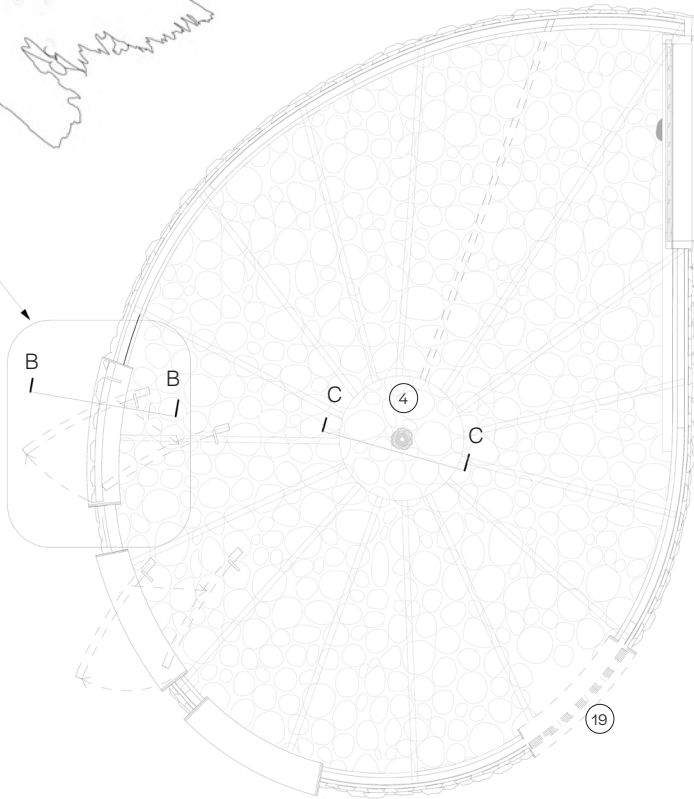
Removable Window Blocks for Winterization



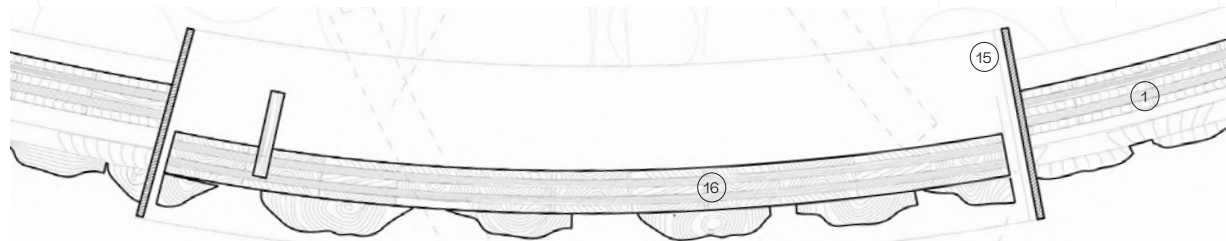


Detailed Plan A

Detailed Elevation



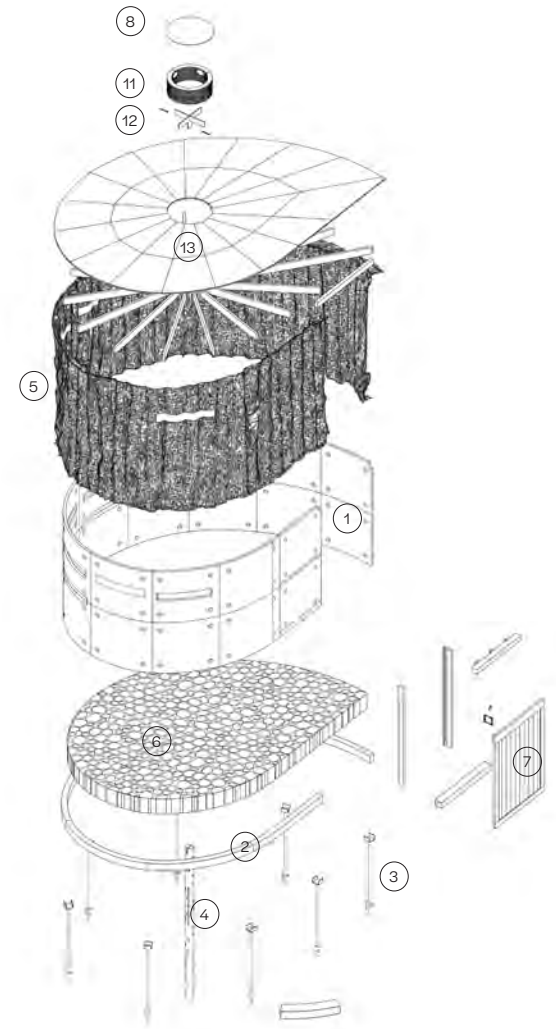
Plan



Detailed Plan A

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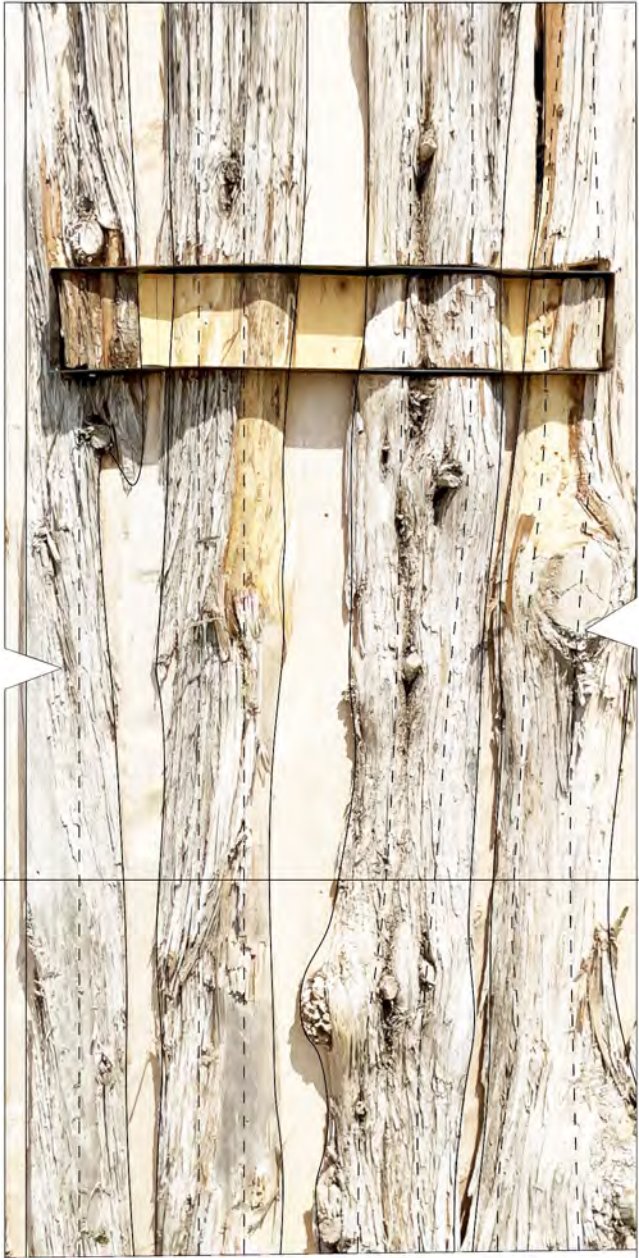
19



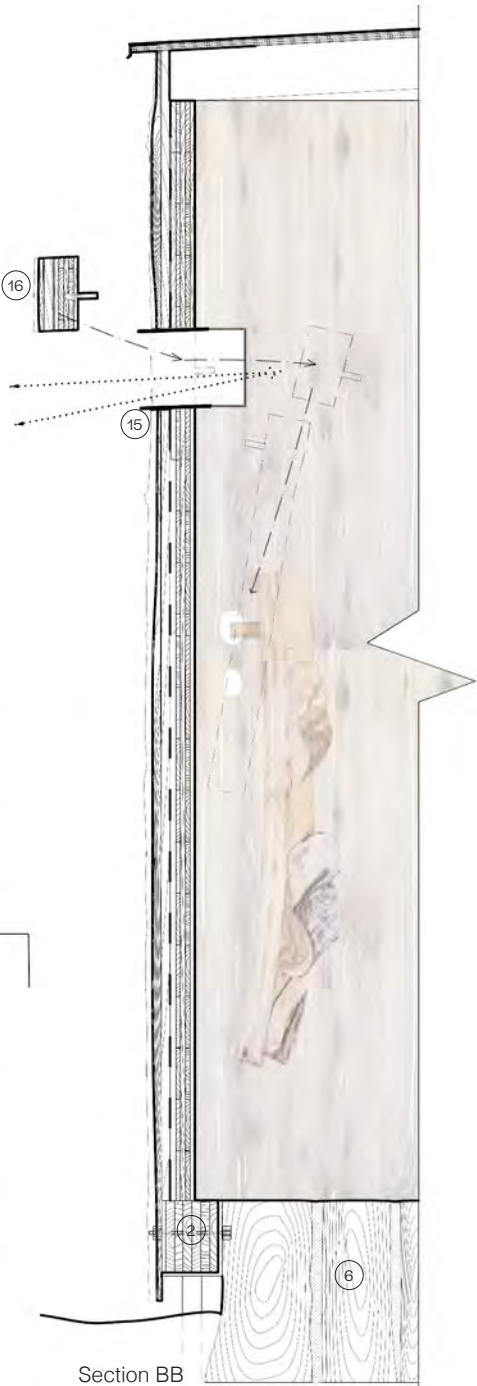
Exploded Axo

Legend

- | | |
|---|--|
| 1. Curved CLT panels | 11. Laminated three-quarter-inch ply Oculus ring |
| 2. Curved glulam ground beam | 12. Quarter-inch mild steel cruciform capital |
| 3. Helical piles | 13. Rafters Ply deck roof deck |
| 4. Eastern red cedar round wood column | 14. Roof Membrane |
| 5. Exterior bark and Roundwood section cladding | 15. Sheet steel slot window frame |
| 6. Stump offcuts for parquet floor | 16. Removable CLT/ Bark window blocks for winterizing |
| 7. Sliding door | 17. Path to trail |
| 8. Oculus | 18. Diffuse light to reduce the appearance of humans to the colony |
| 9. Outer Plexiglass Dome | 19. The future window (if the colony expands) |
| 10. Acrylic diffusion disc | |



Detailed Elevation



Section BB



Section CC

