

# CATALOGUE OF SUBMISSIONS

## Outschooled Design Challenge

Bernheim  
ARBORETUM AND RESEARCH FOREST



BERNHEIM'S  
**OUTSCHOOLED**  
creating outdoor learning spaces

With OUTSCHOOLED, we issued a call to the public for creative design solutions for outdoor classrooms on a budget of \$5,000 in materials or less.

With this, we set out to accomplish several things. First, we wanted to leverage and share creative ideas. So often what stops people from trying something new is a lack of ability to see what's possible, and we wanted to show what can be achieved even within the very limited amount of space and resources that most schools have. We wanted to call attention to the idea that any kind of learning can take place outdoors, the same way it takes place indoors — only better. It was the pandemic that brought a certain urgency to the concept of expanding the classroom into the outdoors. But we hope learning outdoors will become a permanent standard practice for schools — because there will never be a vaccine for nature deficit disorder.

We received 22 entries from across the U.S. plus Mexico and Romania from seasoned professional artists, architects, landscape architects and and landscape designers; promising university students; and gifted pre-school, elementary, middle and high school students nurtured by supportive adults.

Designs ranged from simple and practical to whimsical and dreamy to futuristic, and were made of materials from the recycled to the completely natural. All showed an original way to take learning outside at an affordable

cost — complete with storage, furnishings, writing surfaces and shelter from weather. We asked that the designers not design for a specific site but that rather, the designs be something flexible that could work in a variety of situations and under many restrictive conditions — something most schools have.

**“We wanted to call attention to the idea that any kind of learning can take place outdoors, the same way it takes place indoors — only better.”**

We express our gratitude to all who submitted. Thank you for your generosity with your time and creative talents. We hope this design guide will show exciting new and completely realizable possibilities to educators, students, parents, school staff and communities everywhere.

—Kristin Faurest  
Director of Education, Bernheim Arboretum and Research Forest  
April, 2021

*Jury members:*  
*Patrick Piuma, Director, Urban Design Studio of the University of Louisville*  
*Ginny Delaney, Naturalist, Jefferson Memorial Forest*  
*Claude Stephens, Facilitator of Outreach and Regenerative Design, Bernheim*  
*Kristin Faurest, Director of Education, Bernheim*

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PROFESSIONAL

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UNIVERSITY

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COMMUNITY



**AWARD: FIRST PLACE,  
PROFESSIONAL CATEGORY**

**DESIGNER: Brandeis Elementary  
School Architecture Club with  
Brad Benz & Nathan Smith of  
Luckett & Farley**

**LOCATION: Louisville, Ky.**

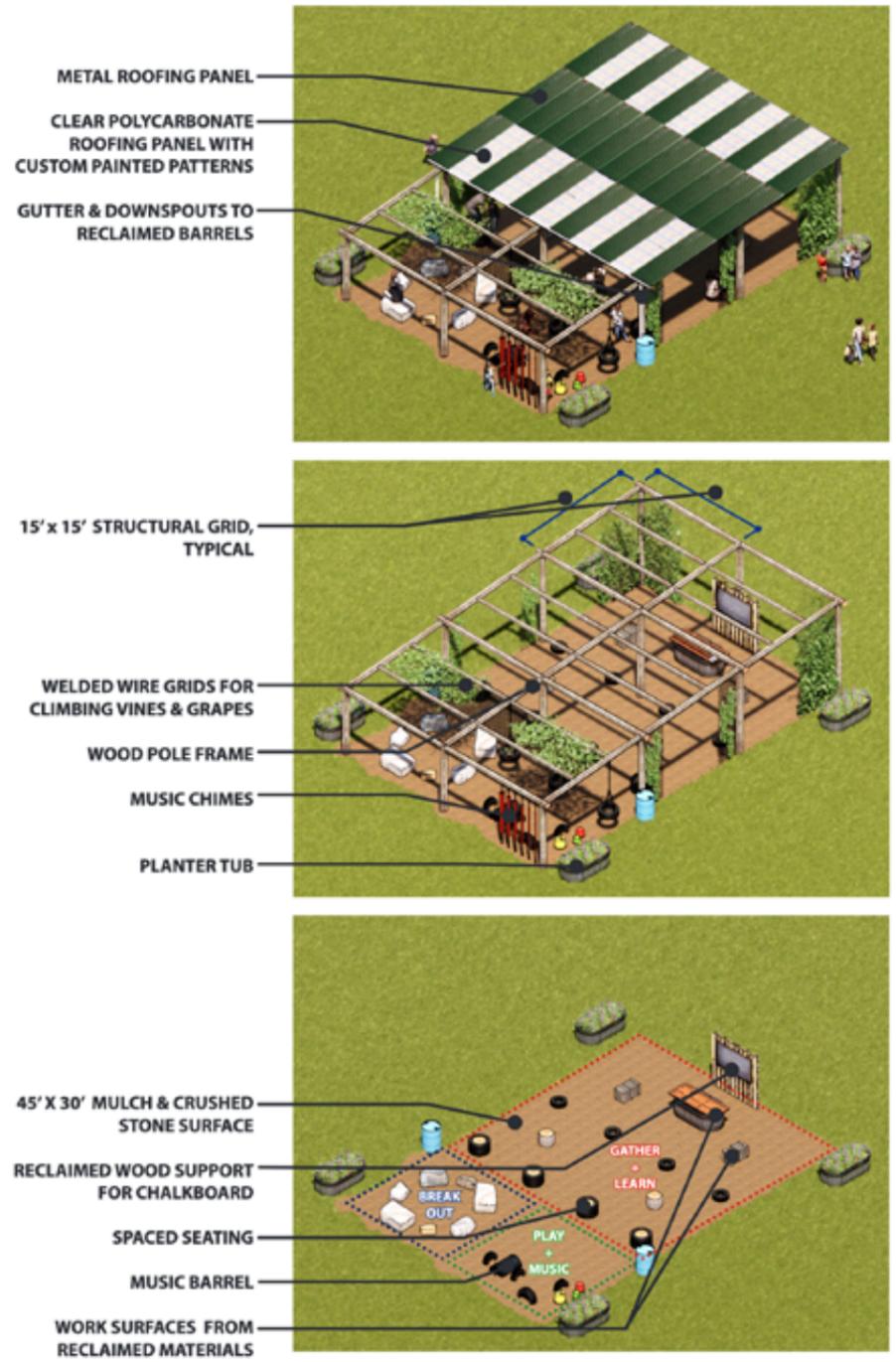
**TITLE: The Pavilion**

**What the jury said:**

“It is simple in some aspects, but incorporates so many of the things that would make for a very functional and interesting outdoor classroom. The use of tires for seating is great since it is finding a new use for something that doesn’t break down very easily.”

“Like the large, airy, natural look, options for shade and sun. Love the use of reclaimed materials, especially tires repurposed for swings, seats, drums. Big chimes are fun.”

Outschooled Materials Allowances <i>(purchased materials only)</i>		
item	notes	cost
utility poles	reclaimed	\$ 1,500
steel components	for pole connections	\$ 350
galvanized tubs	for plantings	\$ 520
rain barrels	reclaimed	\$ 60
gutter	reclaimed	\$ 50
downspouts and fittings	reclaimed w/ new fittings	\$ 60
chalkboard		\$ 80
roof panel-metal	reclaimed if possible	\$ 350
roof panel-polycarbonate	new	\$ 500
welded wire mesh	for climbing plants	\$ 550
fasteners	various, roof and mesh	\$ 200
wood components for roof	milled from reclaimed	\$ 50
mulch		\$ 300
compacted stone	accessible ground surface	\$ 150
plant allowance (climbing vines and grapes)		\$ 180
		<b>total \$ 4,900</b>



PERSPECTIVE VIEW OF OUTDOOR CLASSROOM



VIEW FROM DRUM SEATS TOWARD BLACKBOARD



EXTERIOR VIEW TOWARD CHIMES

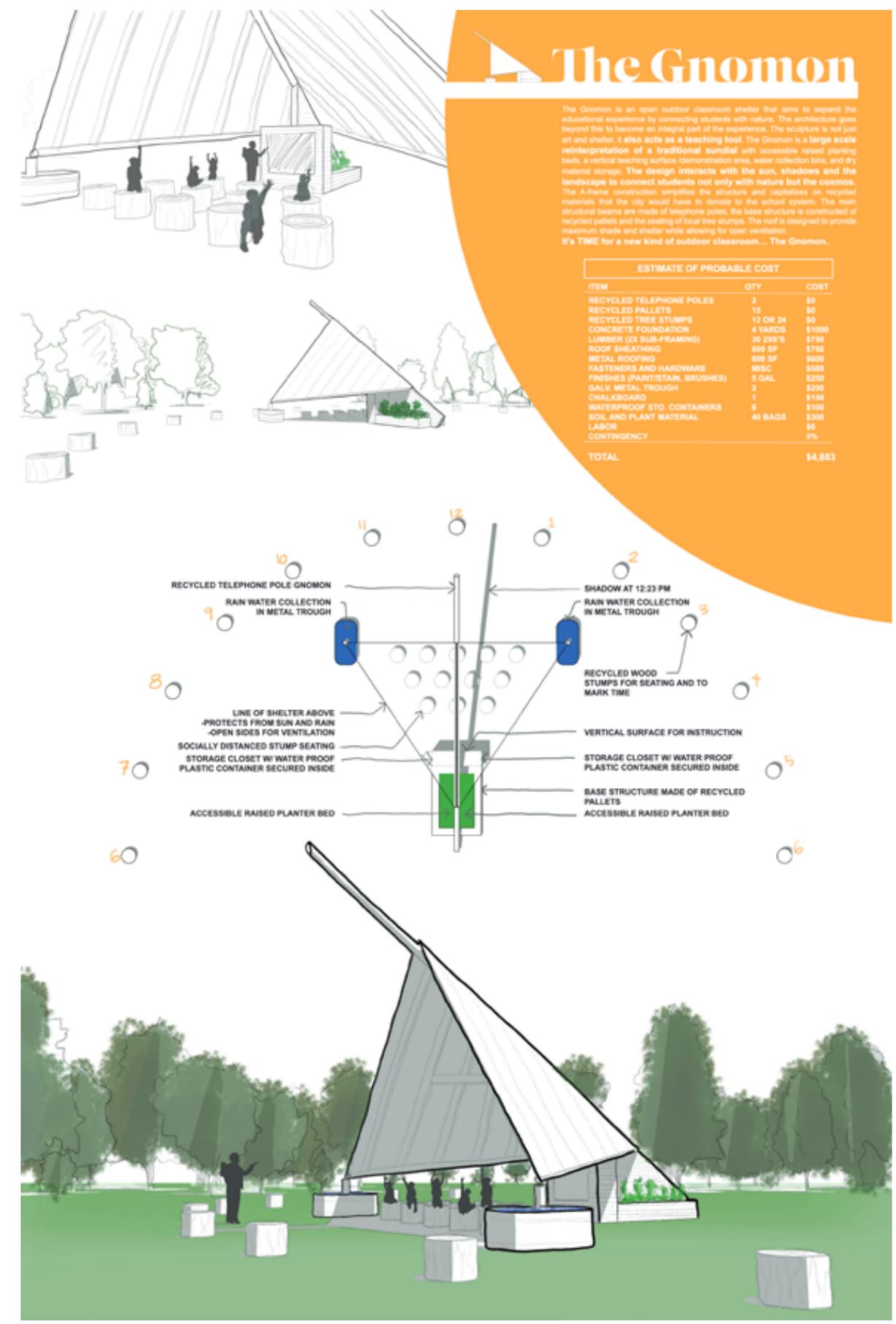
**AWARD: JOINT FOR SECOND PLACE, PROFESSIONAL CATEGORY**

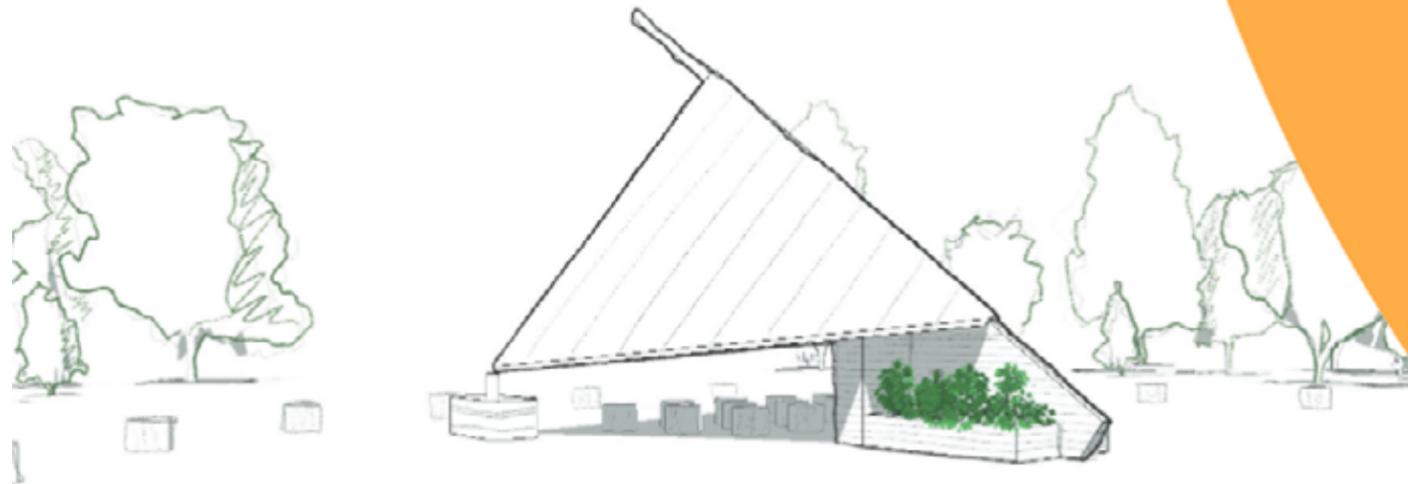
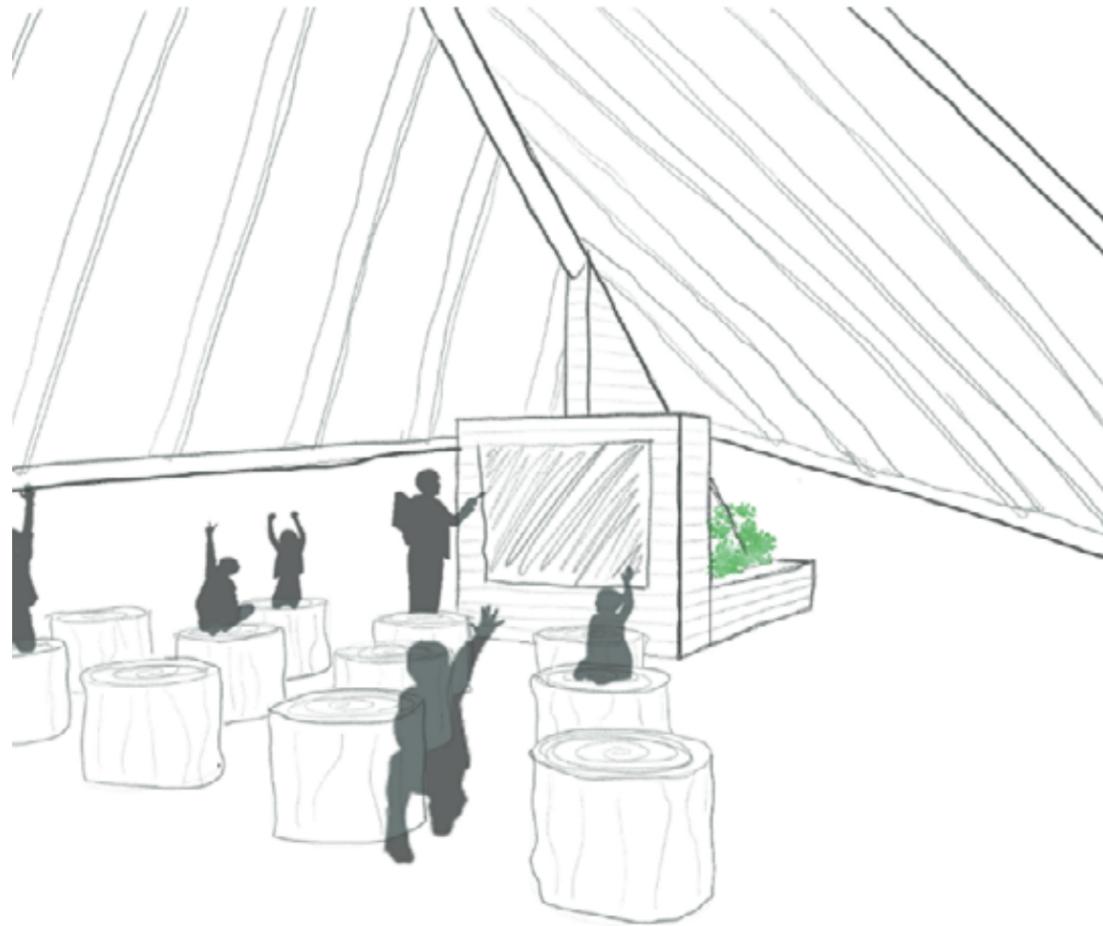
**DESIGNER: Dave Mayo, AIA, Studio MAYO Architects**  
**LOCATION: Louisville, Ky.**  
**TITLE: The Gnomon**

**What the jury said:**

“The sundial concept is brilliant. I love the simplicity and the elegant integration of form and function.”

“I really love the design of the structure. I think that it would be an elegant addition to any setting and provide the necessities for a successful outdoor classroom.”





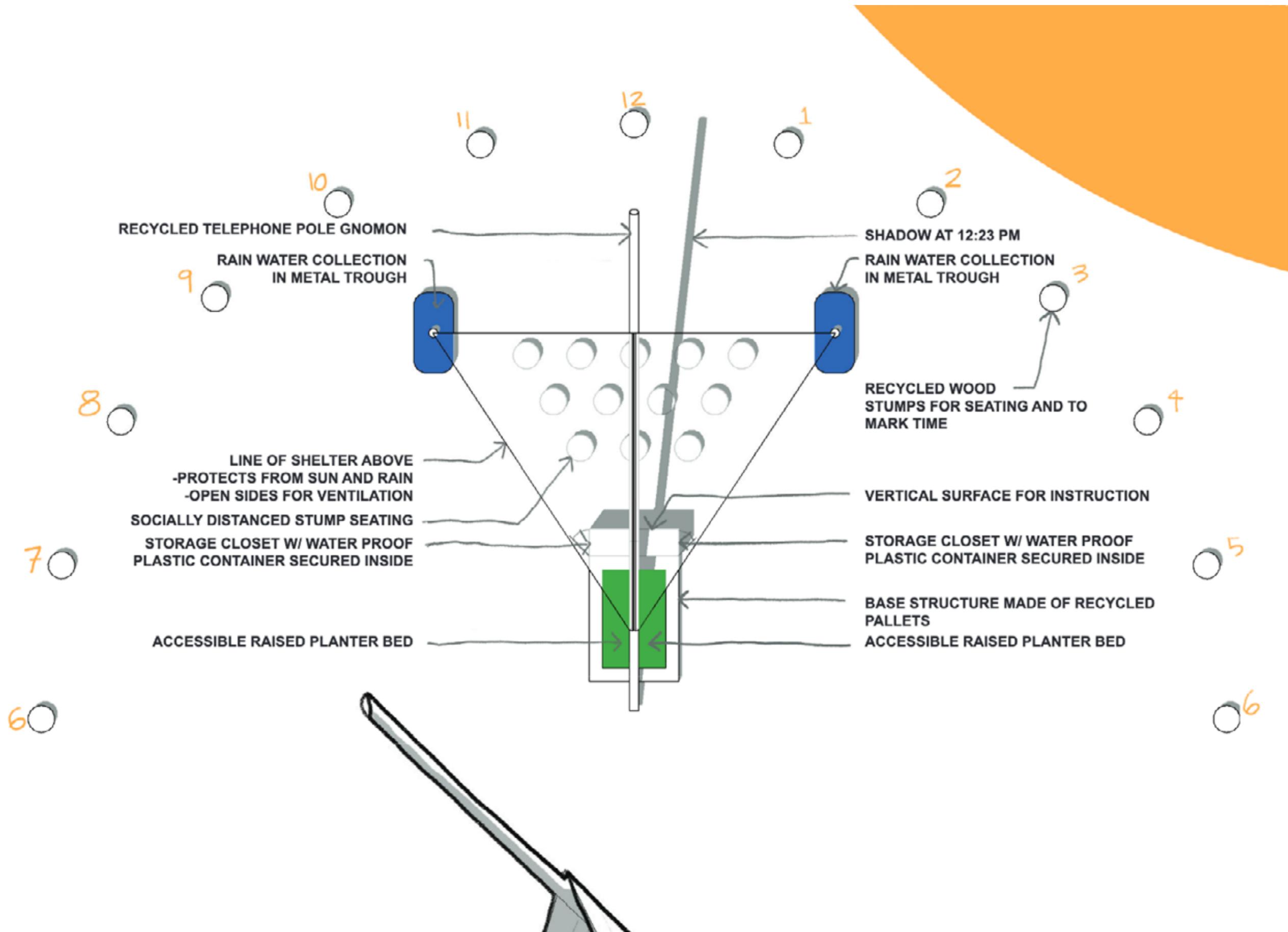
# The Gnomon

The Gnomon is an open outdoor classroom shelter that aims to expand the educational experience by connecting students with nature. The architecture goes beyond this to become an integral part of the experience. The sculpture is not just art and shelter, it **also acts as a teaching tool**. The Gnomon is a **large scale reinterpretation of a traditional sundial** with accessible raised planting beds, a vertical teaching surface /demonstration area, water collection bins, and dry material storage. **The design interacts with the sun, shadows and the landscape to connect students not only with nature but the cosmos.** The A-frame construction simplifies the structure and capitalizes on recycled materials that the city would have to donate to the school system. The main structural beams are made of telephone poles, the base structure is constructed of recycled pallets and the seating of local tree stumps. The roof is designed to provide maximum shade and shelter while allowing for open ventilation.

**It's TIME for a new kind of outdoor classroom... The Gnomon.**

## ESTIMATE OF PROBABLE COST

ITEM	QTY	COST
RECYCLED TELEPHONE POLES	2	\$0
RECYCLED PALLETS	15	\$0
RECYCLED TREE STUMPS	12 OR 24	\$0
CONCRETE FOUNDATION	4 YARDS	\$1000
LUMBER (2X SUB-FRAMING)	30 2X6'S	\$750
ROOF SHEATHING	600 SF	\$750
METAL ROOFING	600 SF	\$600
FASTENERS AND HARDWARE	MISC	\$500
FINISHES (PAINT/STAIN, BRUSHES)	5 GAL	\$250
GALV. METAL TROUGH	2	\$250
CHALKBOARD	1	\$150
WATERPROOF STO. CONTAINERS	6	\$100
SOIL AND PLANT MATERIAL	40 BAGS	\$300
LABOR		\$0
CONTINGENCY		5%
<b>TOTAL</b>		<b>\$4,883</b>



**AWARD: JOINT FOR SECOND PLACE, PROFESSIONAL CATEGORY**

**DESIGNER: Jena Jauchius PLA, Dezire Clark Meindersee & Arnulfo Castro**

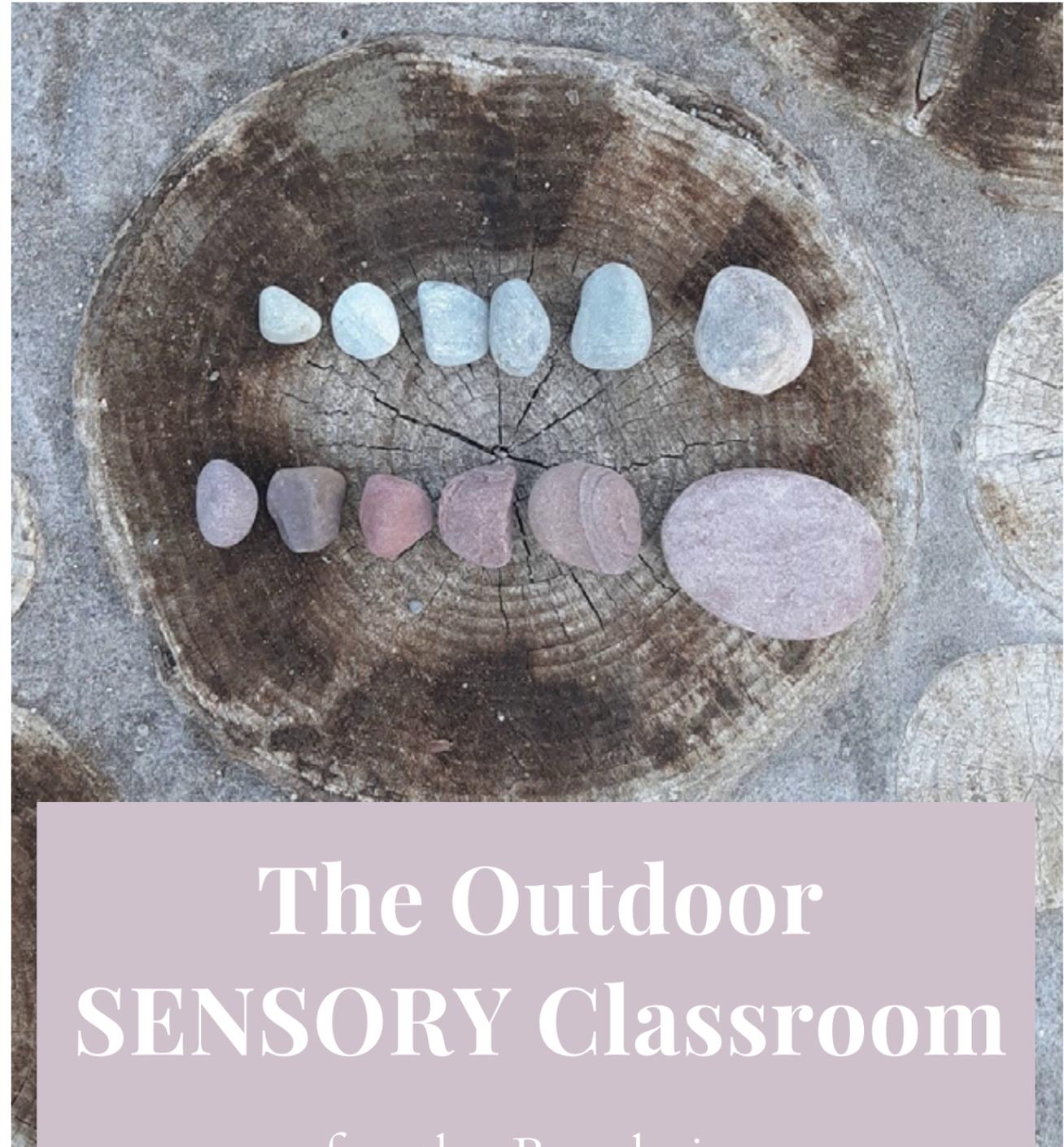
**LOCATION: Seattle, Wash.; Portland, Ore.**

**TITLE: The Outdoor Sensory Classroom**

**What the jury said:**

“Very detailed and well-thought-out. Includes most desired elements. Simple, flexible. Like the attention to sensory detail, inclusion of different seating spaces for different preferences and clipboards for students to write on.”

“The design is not only beautiful and nature-inspired, it’s grounded in solid and well-explained theory and methodology. It’s practical to realize and also contains a lot of elements that can be done with/by children who will be using the space.”



# The Outdoor SENSORY Classroom

for the Bernheim  
OUTSCHOOLED Competition

February 26, 2021

Jena Ponti Jauchius, Landscape Architect      Deziré Clark Meindersee, Educator  
Arnulfo Castro, Illustrator

# The Outdoor SENSORY Classroom

## The Design Idea

Students and educators alike are challenged in this contemporary landscape of learning. In light of the COVID-19 epidemic, we must consider the outdoors as an equally, if not moreso, effective learning environment as the traditional indoor classroom.

Research shows that, for children, time spent in natural environments has incredible benefit, including holistic development, improved attention and focus, reduced stress and anxiety, sensory balance, imagination, wonder, and many other things that are essential in childhood.

In this context, our **core design principles** for the Outdoor Sensory Classroom are:

- Simplicity
- Flexibility
- Authenticity
- Inclusivity, and
- Sensory engagement

### Simplicity

A simple, effective design has the ability for greater scalability and translation from one site to another. Simplicity is a key principle so schools and other organizations can easily replicate the design in a variety of site conditions.

### Flexibility

The design offers both permanent seating and portable seating options to offer a flexible teaching and learning environment. When activities require more space, the portable seating can be moved to provide a larger open space for a variety of activities. A small chalkboard is included for learning activities, and can also be a tool for community connection. Messages such as "What do you love about our neighborhood?" can prompt dialogue between students and neighbors.

### Authenticity

In order to truly connect with nature, children must experience the real thing. Our design focuses on natural, durable, sustainable materials that give students authentic experiences and connection with the natural world.



A sensory path, installed at the Outdoor Learning Lab at Bemiss Elementary in Spokane, WA, provides students multi-dimensional sensory experiences, learning opportunities, and adds beauty to their environment.

### Inclusivity

Inclusivity is essential, and we address this design principle from several angles. The first relates with accessibility. The design uses compacted gravel surfacing, an ADA-accessible surface, for much of the classroom area. The central sensory surfacing area may not be "accessible", depending on what materials are chosen. However, many materials can be installed in such a way that a student or teacher in a wheelchair can conceivably navigate across. The variety in surfacing materials offers a different experience, increased challenge (proprioceptive sensory system), and a multi-sensory experience.

All three learning log benches are designed to be accessible, meeting the standards for a transfer platform, such as in a public playground. A student in a wheelchair, if able, can transfer from their chair to the seating area of the learning log.

The second relates to our sensory-based approach. *All children learn through their senses.* Whether students are physically challenged, have developmental disabilities, are neurodiverse, or are typically developing, they learn about the world and their place within it through their sensory experiences. A sensory-rich environment leads to a more inclusive learning environment.

# The Outdoor SENSORY Classroom

## Sensory Engagement

Learning landscapes that are sensory-rich help foster deeper connections: in learning, with others, and with nature. Within any student population, children's sensory needs can be diverse.

A learning landscape is most effective when it engages a child's seven senses: sight, touch, taste, smell, sound, vestibular, and proprioception.

The Outdoor Sensory Classroom stimulates these seven senses, both in design and programming of the space.

- **Sight** - Visual interest includes the form and height of the shade sail structure, the central sensory surfacing area, and learning log benches. Schools can also add to the visual quality by painting the posts, shade sail color selection, and including detailed features such as stone mosaics in the sensory surfacing.
- **Touch** - Use of wood posts. The learning log benches ideally have areas of bark still attached. The sensory surfacing has incredible tactile qualities based on the materials used.

- **Taste** - Taste can be incorporated in programming. This area is a great place for outdoor meals and snacks. Learning activities can include edible/native/medicinal plants.
- **Smell** - Learning in an outdoor setting is often a very positive olfactory experience just for the fact that we're closer to nature.
- **Sound** - Auditory stimulation comes from all around, the breeze, birdsong, gravel crunching under foot, and different sounds made from moving across the various sensory surfacing materials.
- **Vestibular** - Many children need movement in order to learn. Our design includes hardware attachments between posts to accommodate a hammock. For those students who need more vestibular input, a simple hammock can make a big difference.
- **Proprioception** - When students move, set up, and store their portable stools and tables, their proprioceptive system is engaged. The sensory surfacing also provide proprioceptive input as it presents a higher degree of challenge than, for example, walking on a concrete path.

## The Outdoor Sensory Classroom

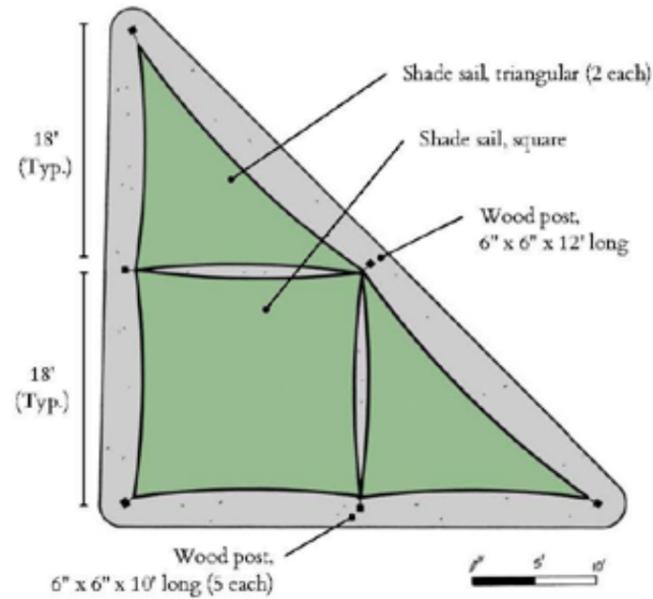


# The Design Drawings

These plan views of the Outdoor Sensory Classroom space illustrates the following design features:

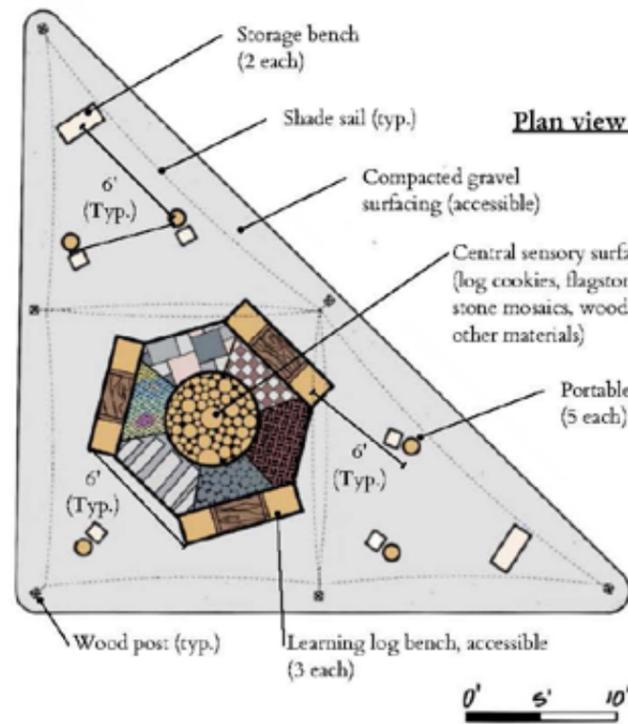
- Shade sails and 6" x 6" wood posts with concrete/sonotube footings and stainless steel hardware
- Central sensory surfacing area
- Learning log benches (3 each)
- Moveable seating (portable stools/tables and storage benches)
- Storage bench, 50 Gal. (2 each)
- Chalkboard
- Clipboards (11x17)
- Hardware attachment between posts for hammock
- E-Guide for loose parts play

**Plan view of the layout of the shade sails and wood posts**



Note: Wood posts are set directly into concrete footings. Concrete footings for all wood posts should be 18" dia. (with a sonotube), and 36" deep.

**Plan view of the Outdoor Sensory Classroom**



Note: The primary teaching area is the central space. A chalkboard can either be mounted to a post or used in hand. The flexibility of the space affords a teacher more ways of teaching, types of activities, and greater interaction with students.

# The Design Details

## Black Locust Lumber (Simplicity, Authenticity, Sensory Engagement)

All wood products, the shade sail posts and the log benches, are black locust. Lumber from this species (*Robinia pseudoacacia*) has a long list of benefits which makes it an ideal wood for outdoor classroom applications. This type of lumber is readily available in much of the U.S. and it has exceptional durability and longevity. It's one of the most decay- and insect-resistant species. It can successfully endure decades of harsh climate conditions with minimal maintenance, including staining or sealing. Additionally, black locust is considered an invasive species in parts of the U.S. and is fast-growing, making this lumber is an eco-friendly choice.

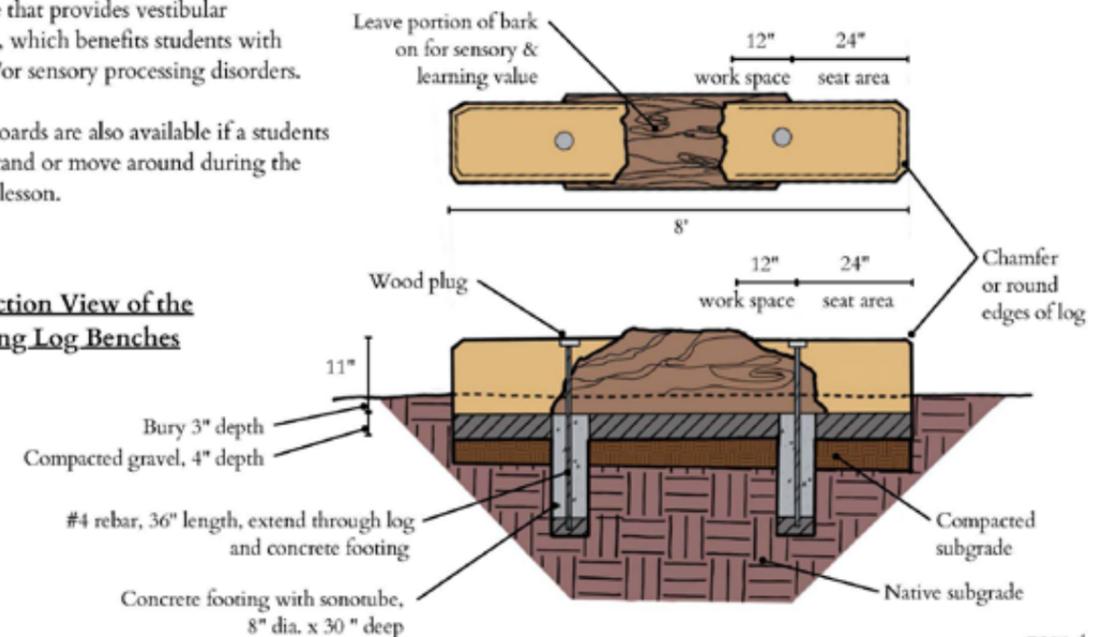
## Seating Options (Flexibility, Inclusivity, Sensory Engagement)

Students can choose from a variety of seating options: the learning log benches (seating for 6 students), portable stools and tables (seating for 5 students), and the storage benches (seating for 2 students).

Included in the design is hardware to mount a hammock between posts. This offers another option, one that provides vestibular stimulation, which benefits students with autism and/or sensory processing disorders.

Large clipboards are also available if a student prefers to stand or move around during the course of a lesson.

**Plan/Section View of the Learning Log Benches**



## E-Guide, Loose Parts: Inspiring Play in Young Children, Paperback or Kindle Edition

By Lisa Daly & Miriam Beloglovsky  
<https://www.amazon.com/Loose-Parts-Inspiring-Young-Children-ebook/dp/B00NE6PBR4>

Sometimes teachers need a little extra guidance and activity ideas. This guide helps teachers engage children in loose parts play, which is a type of play with immense play and learning value.

## Learning Log Benches (Inclusivity, Authenticity, Sensory Engagement)

The three log benches provide ADA-accessible seating options within the central area. Logs are a minimum of 14 inches in diameter and 8 feet in length. Each end is planed to provide a flat, smooth seating area and work space (see detail below for dimensions). The logs are firmly secured in place with rebar and concrete footings.

Ideally, an area of bark is preserved on the log for learning, sensory stimulation, and nature connection.

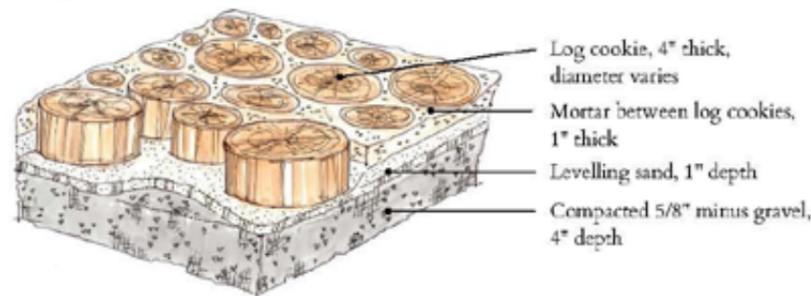
## Sensory Surfacing (Inclusivity, Authenticity, Sensory Engagement)

The central area is largely defined by its interesting ground plane. Sensory surfacing, similar to this image of a sensory path, gives students multi-dimensional sensory experiences (sight, touch, sound, and proprioception), learning and discovery, and adds beauty to their classroom. The area can be built from locally-available materials and tailored to each site for place-based character.

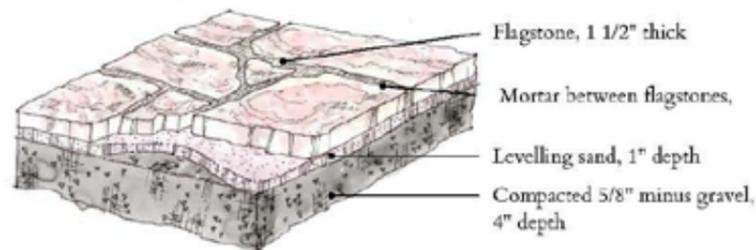


## Sensory Surfacing Construction Details

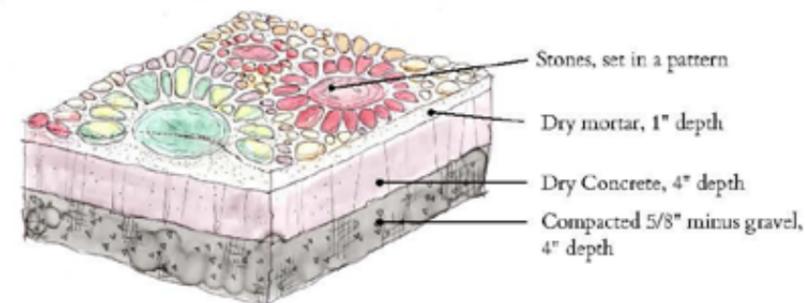
### Log Cookies



### Flagstone



### Stone Mosaic



The construction of sensory surfacing can be relatively easily and a great volunteer and/or student project.

Here are three details for the installation of log cookies, flagstone, and a stone mosaic. If other surfacing materials are used, such as pavers, bricks, log posts, and similar items, they can be installed similarly to what's shown here.

**Notes on the stone mosaic:**  
The area for the mosaic should first be contained by 2 x 4 lumber or landscape edging. Over the top of the compacted gravel layer, a 4" thick layer of DRY concrete should be installed. Then, a 1" layer of DRY mortar should be installed on top of the dry concrete. The stones can be set in the dry mortar layer, with approximately 1/2 - 2/3 of the stone set into the mortar. Once the pattern is laid, use a hose and spray attachment set on the 'mist' layer to wet down the mortar and concrete. The spraying may take a long time - 45 minutes or longer - to ensure water seeps down through the mortar and concrete.

Protect the mosaic from foot traffic for 2-3 days to give the mortar and concrete time to properly set. Once set, apply several layers of concrete/stone sealer per manufacturer's recommendations.

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## Products & Sources

Many of the materials used in this design can be purchased from a variety of sources. The following products were selected for their durability, price point, and ease of replacement.

### Portable Stools

Source: dickblick.com



### Portable Camp Table

Source: walmart.com



### Storage Bench, 50 Gal.

Source: target.com



### Chalkboard

Source: homedepot.com

Stores easily in the storage bench



## Maintenance

The Outdoor Sensory Classroom is a low-maintenance space due to the careful materials selection and simple design.

For best success, the space and its materials should receive regular monitoring.

The black locust wood features, as previously stated, require little maintenance but should be included in routine inspections.

The compacted gravel surfacing that is throughout the majority of the space will need occasional refreshing and compacting. This may be an annual effort.

To maximize the life of the shade sails, they should be taken down and stored during winter months when snow load is an issue. In other climates, the sails may stay up year-round.

All hardware should be inspected routinely. Stainless steel hardware is more durable than hardware of other types and finishes.

Items such as the portable stools and tables, the storage benches, will need daily cleaning and disinfecting and replacement based on intensity of use.

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# Budget

The overall budget for the Outdoor Sensory Classroom nears the \$5,000 budget for the competition. A detailed cost estimate and materials description is provided below.

There are factors that can reduce the costs of the classroom, including:

- Donated logs for the learning benches. Often logs can be obtained from local arborists, landscape contractors, municipal parks departments, school district facilities, and other sources.
- Donated or reduced-priced materials for the sensory surfacing area. Landscape contractors often have extra materials from projects and are willing to donate, or offer a decreased price, for leftover materials. Pavers, bricks, and other materials can be found on sites like Craigslist and Facebook marketplace at low prices.

\* Cost Estimate reflects materials costs only.

Item #	Description	Quantity	Unit	Unit Price	Total
<b>1</b>	<b>Shade Sail Structure</b>				
	Shade Sail, Right Triangle (18' x 18')	2	EA	\$82.46	\$164.92
	Shade Sail, Square (18' x 18')	1	EA	\$64.99	\$64.99
	Installation Hardware Kit for Triangular Sail, Stainless Steel	2	EA	\$36.00	\$72.00
	Installation Hardware Kit for Square Sail, Stainless Steel	1	EA	\$28.00	\$28.00
	Wood Post, Black Locust, 6" x 6" x 12'	1	EA	\$360.00	\$360.00
	Wood Post, Black Locust, 6" x 6" x 10'	5	EA	\$300.00	\$1,500.00
	Concrete Footings for Posts, w/Sonotube (18" x 18" x 36")	1.5	CY	\$125.00	\$187.50
	<b>Subtotal</b>				<b>\$2,377.41</b>
<b>2</b>	<b>'Classroom' Area &amp; Features</b>				
	Compacted Gravel Surfacing, 5/8" Minus, 4" Depth	9	CY	\$47.00	\$423.00
	Natural Logs, 14" Dia, 8' Long	3	EA	\$250.00	\$750.00
	Top Planed Flat with Seat Each Side, Chamfered Edges				
	Weather-Proof Resin Storage Bench, 50 Gal.	2	EA	\$79.00	\$158.00
	Portable Folding Stools	5	EA	\$42.43	\$212.15
	Portable Folding Camp Table, Aluminum	5	EA	\$24.94	\$124.70
	Chalkboard, 18.25" x 27.25"	1	EA	\$44.97	\$44.97
	Large Clipboard, 11x17	13	EA	\$9.99	\$129.87
	Heavy Duty Lag Screw Eye Hardware Kit for Hammock, (Hammock Not Incl.)	1	EA	\$13.99	\$13.99
	<b>Subtotal</b>				<b>\$1,856.68</b>
<b>3</b>	<b>Sensory Features &amp; Learning</b>				
	Sensory Surfacing	125	SF	\$5.00	\$625.00
	Heavy Duty Lag Screw Eye Hardware Kit for Hammock & Ropes	1	EA	\$13.99	\$13.99
	E-Guide PDF, Loose Parts: Inspiring Play in Young Children	1	EA	\$32.99	\$32.99
	<b>Subtotal</b>				<b>\$671.98</b>
	<b>COMBINED TOTAL</b>				<b>\$4,906.07</b>

# Meet the Team!



## the landscape architect

Jena Ponti Jauchius, PLA, CPSI  
N is for Nature Play, LLC



Jena is a landscape architect, nature play specialist of 20 years, and mom of twins. Through her company, N is for Nature Play, LLC, Jena teaches parents and educators how to create sensory-rich nature play and learning spaces for children of all abilities and diversities. Jena lives in a pink farmhouse on several acres outside Spokane, Washington where she and her twins are building their very own sensory garden.



## the teacher

Deziré Clark Meindersee, MS of ELP, Focus on Sustainability in Education  
Cedar Tree Learning

Deziré is a mom of four young explorers and Owner of Cedar Tree Learning, a mixed-aged learning community that supports the playful creativity, joy, and natural beauty that is childhood. Deziré is a passionate educator, with experience teaching students with autism and sensory processing challenges. Her work is steeped in the belief that all children thrive with time to play, imagine, and challenge themselves. She lives with her beautiful family in Portland, Oregon.



## the illustrator

Arnulfo Castro

Arnie is a landscape designer and artist who calls Seattle, Washington home. His work experience has focuses largely on hiking and biking trail design and construction in the Pacific Northwest. There's no doubt that feeds Arnie's love of mountain biking. It's his thing.

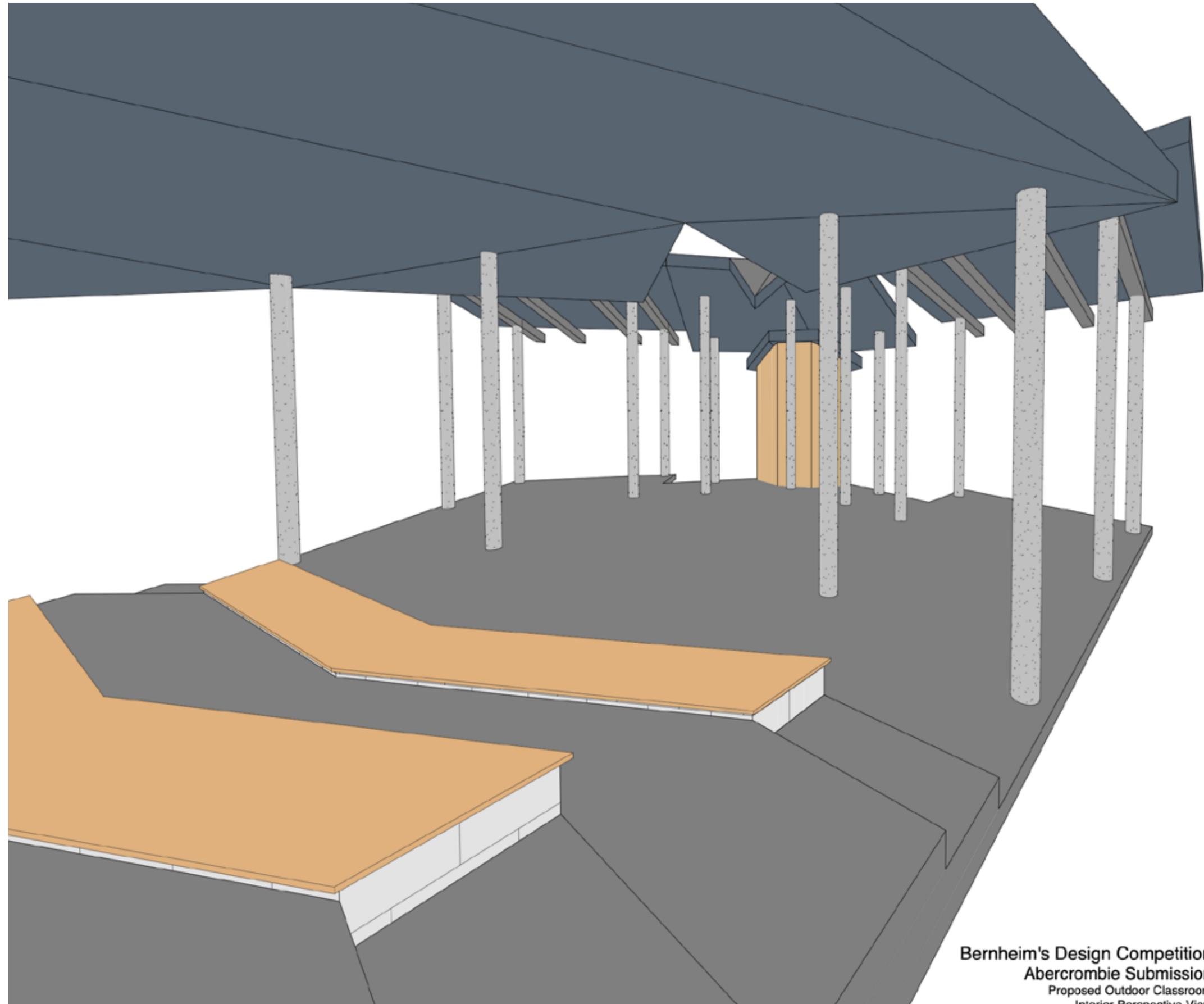


DESIGNER: **Sean Abercrombie**  
 LOCATION: **Louisville, Ky.**  
 TITLE: **The Cicada**

**What the jury said:**

“The concept of the cicada gives a very powerful identity to this design. It’s also a striking composition and really aesthetically pleasing as well as practical. Interesting use of a bioform with regional significance especially in certain years. The simplicity of the raised seating tiers creates adaptable space.”

Bernheim's "OUTSCHOOLED" Design Competition	
Submission by: Sean W. Abercrombie AIA, LEED AP	
The "Cicada"	
Roof Assembly	
Roof #1 (Student Assembly Space)	884 sqft.
Roof #2 (Presentation Space)	205 sqft.
Roof #3 (Presentation Space)	205 sqft.
Roof #4 (Presentation Space)	184 sqft.
Roof Assembly SQFT. Total:	1,478 sqft.
Estimated Assembly Cost Sub-total:	\$3,300
Roof Vertical Supports	
Poured-in-place Concrete Columns & Foundation	20 units
Estimated Assembly Cost Sub-total:	\$600
Split-Face Concrete Wall Assemblies	
Low Height Walls (Student Assembly Space)	100 units
Estimated Assembly Cost Sub-total:	\$225
Wood Bench Seat Assemblies	
Wood Bench Seat (Student Assembly Space)	393 bd. ft.
Estimated Assembly Cost Sub-total:	\$350
Supply Storage Assembly	
Supply Storage Shed Assembly	12 sqft.
Estimated Assembly Cost Sub-total:	\$525
*Not included in cost breakdown is any site work (i.e. dirt, fill & grading) associated with final project location	
Project Construction Estimate:	\$5,000



Bernheim's Design Competition  
 Abercrombie Submission  
 Proposed Outdoor Classroom  
 Interior Perspective View

# OUTSCHOOLED BERNHEIM'S Design Competition

March 5, 2021

Submitted by: Sean W. Abercrombie, AIA, LEED AP

## DESIGN APPROACH:

In analyzing the key elements making up an "outdoor classroom", it became apparent that the roof assembly is the biggest driver in carving out this assembly space. The decision was made to focus primarily on a roof design which led to studying multiple folded planes and bent forms found in different origami patterns. To narrow down the appropriate origami pattern required a spatial analysis to determine the different spatial conditions associated with this project. Specifically, (3) defined zones were identified for the classroom as noted in the competition's program description. These zones include a "Student Assembly" space, a "Presentation" space, and an enclosed "Supply Storage" space. Each zone needs to be sized appropriately based on the number of intended end users (ex. Student Assembly space needs to host 13 socially-distanced students which will require approx.. 375-400 sqft.) and the tasks intended to be performed. As a result, of this design study + spatial analysis + program requirements, this solution chose to pursue the *cicada* origami pattern as the primary design strategy for the project's roof creation.

## DESIGN ASSUMPTIONS:

With the competition description providing loose program requirements, some assumptions were made in order to proceed with generating a more cohesive design solution. For instance, an assumption was made that no cost will be associated with potential site work (ie. dirt & fill) once the final location is selected as the campus may be able to provide these materials. Another assumption is that the outdoor classroom is not intended to be used during the winter/snow seasons, impacting the overall layout and composition of the proposed roof assembly. Lastly, it is assumed that no power or electric will be routed to this project location and any electrical needs will be addressed with portable power devices. Making these assumptions helped to navigate around the project's budget & intended functions and was a necessary measure in crafting this submission.

## PROJECT COST ESTIMATE:

Refer to accompanying submission file for a copy of the proposed project estimate. Prices are based on 2021 costs and the assumption that building materials will be purchased with a contractor's discount.

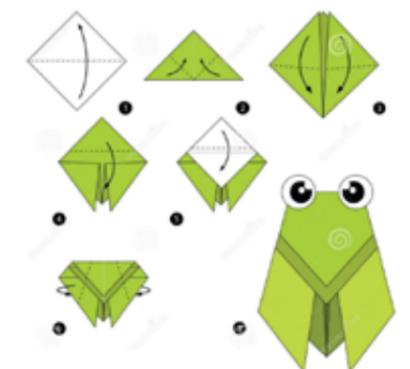
## CONCEPT IMAGES:



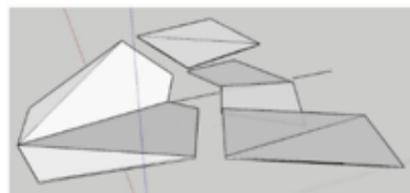
Existing Outdoor Classroom Sample by Others



Existing Outdoor Seating Sample by Others

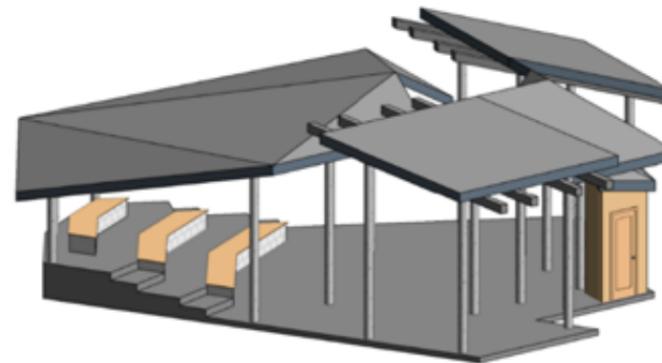


Cicada Origami Pattern

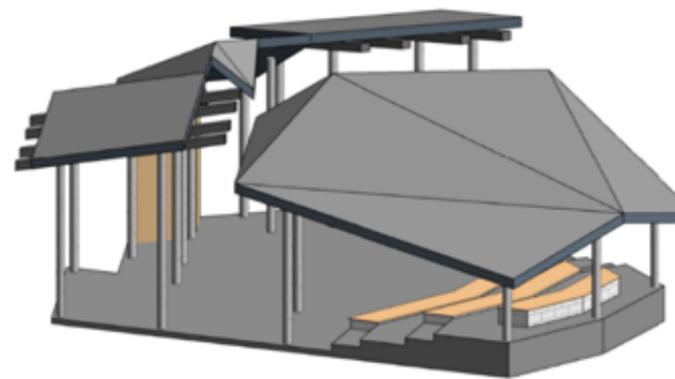


Initial Floor Design Concept Sketch

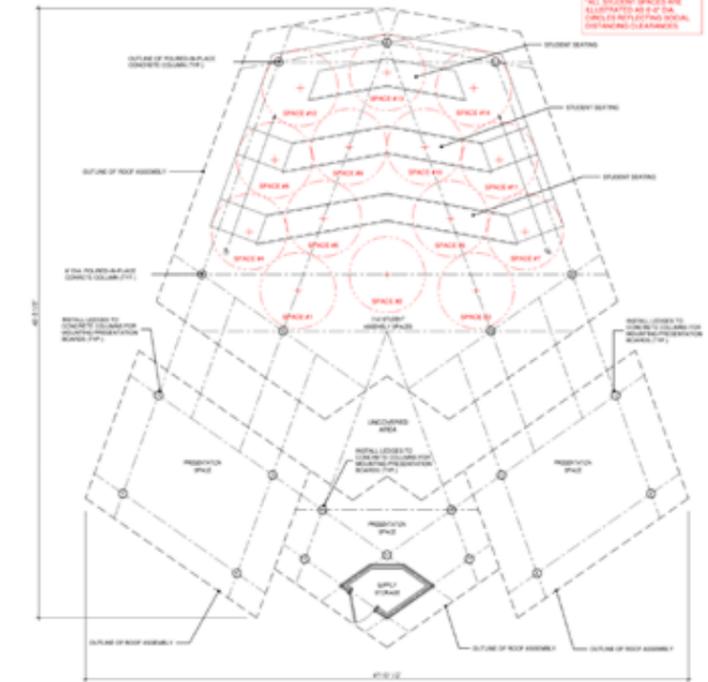
the Cicada



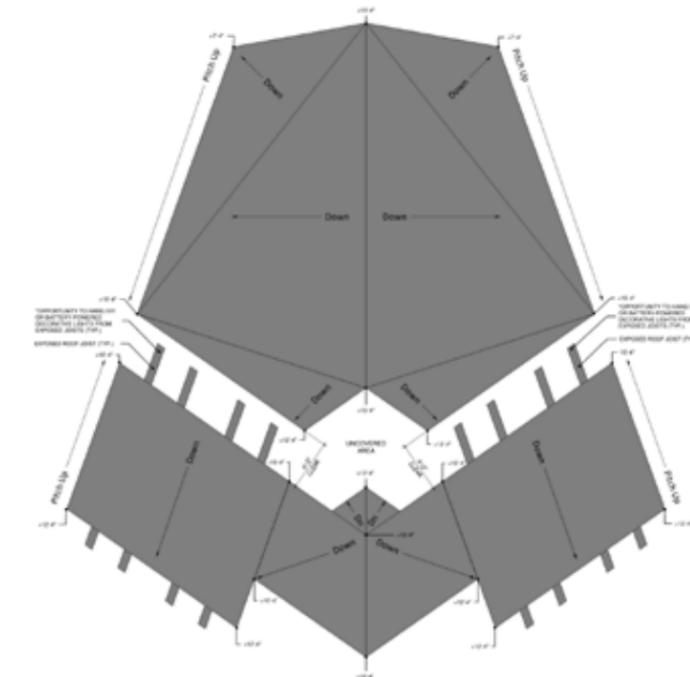
Proposed Outdoor Classroom Perspective #1



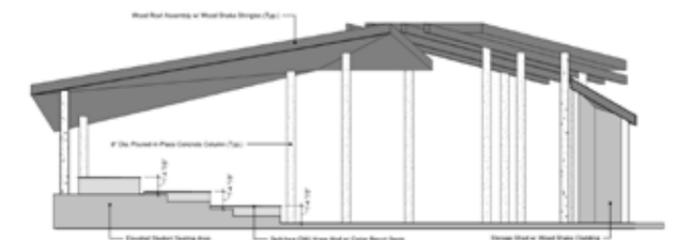
Proposed Outdoor Classroom Perspective #2



Proposed Outdoor Classroom Floor Plan



Proposed Outdoor Classroom Roof Plan



Proposed Outdoor Classroom Section

# 5

Designer: **Alex Bosse**  
 LOCATION: **Lexington, Ky.**  
 TITLE: **Dogtrot House**

### What the jury said:

“This design has a strong local identity and vibrant color, and is designed in harmony with the seasons. It looks airy and comfortable to use. It’s also practical to construct, with clear instructions provided and simple materials. Interesting dogtrot house and pole barn style connection to KY.”

MATERIAL	SIZE	PRICE	QUANTITY	SINGLE STRUCTURE
#2 Pine	1" x 6" x 8'	\$10.19	12	\$122.28
	2" x 4" x 8'	\$9.57	10	\$95.70
	2" x 4" x 10'	\$12.77	12	\$153.24
	2" x 4" x 12'	\$15.57	23	\$358.11
	2" x 4" x 16"	\$20.77	8	\$166.16
	2" x 6" x 8'	\$11.98	14	\$167.72
Cedar	2" x 8" x 16'	\$31.98	2	\$63.96
	1" x 4" x 8'	\$3.86	78	\$301.08
Roof Panels	1" x 2" x 8'	\$1.98	52	\$102.96
Roof Gutter	2" x 2" x 8'	\$22.98	8	\$183.84
	2" x 2" x 12'	\$32.98	8	\$263.84
Large Hinges (doors)	4.5" x 120"	\$4.58	4	\$18.32
	5.388" (2 pack)	\$10.98	3	\$32.94
	Small Hinges (decks)	2" (2 pack)	\$2.47	6
Chains	1' lengths	\$0.69	60	\$41.40
Screws	T25 3" zinc	\$29.98	1	\$29.98
	TimberLOK 5"	\$39.98	1	\$39.98
	Teks 1" roofing screws	\$10.98	2	\$21.96
Simpson Strong-Tie	7" Wood to Wood Foundation Strap	\$1.98	6	\$11.88
	3-2/7" Steel Ridge Rafter	\$1.98	14	\$27.72
	H2 5A Hurricane Tie	\$0.48	12	\$5.76
Concrete (column foundations)	6" x 6" Wood to Concrete Base	\$11.98	6	\$71.88
	60lb high strength	\$3.68	5	\$18.40
TOTAL COST OF ONE STRUCTURE				\$2,313.93
SECOND STRUCTURE MULTIPLIER				2
Canvas Tarp	12' x 16'	\$129.00	1	\$129.00
TOTAL COST				\$4,756.86



DESIGNER: **Anthony Heinz May**  
 LOCATION: **Brooklyn, N.Y.**  
 TITLE: **Bernheim Loghouse**

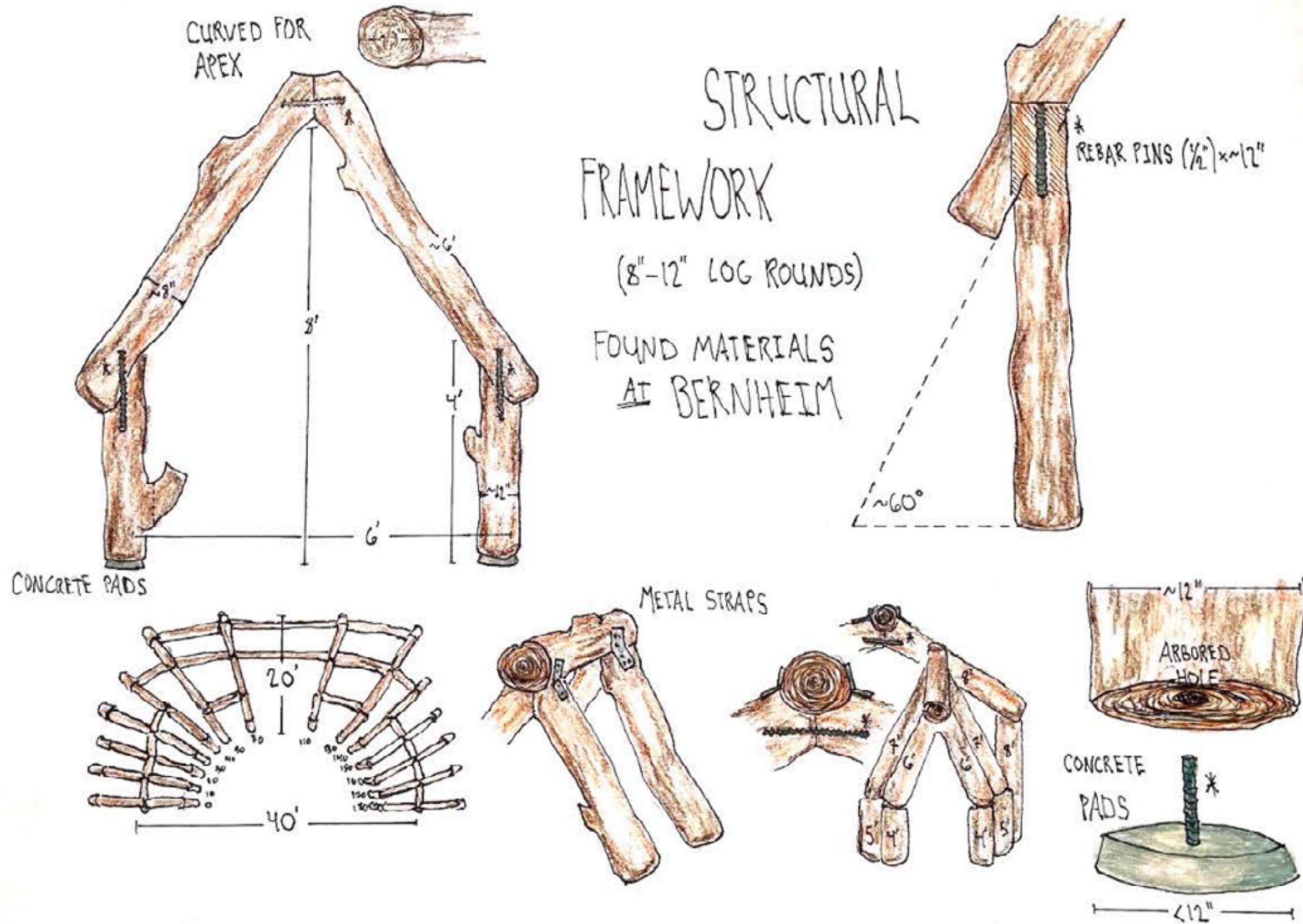
**What the jury said:**

“This looks like such a fantastic space to be in, and it has strong sustainability aspects.”

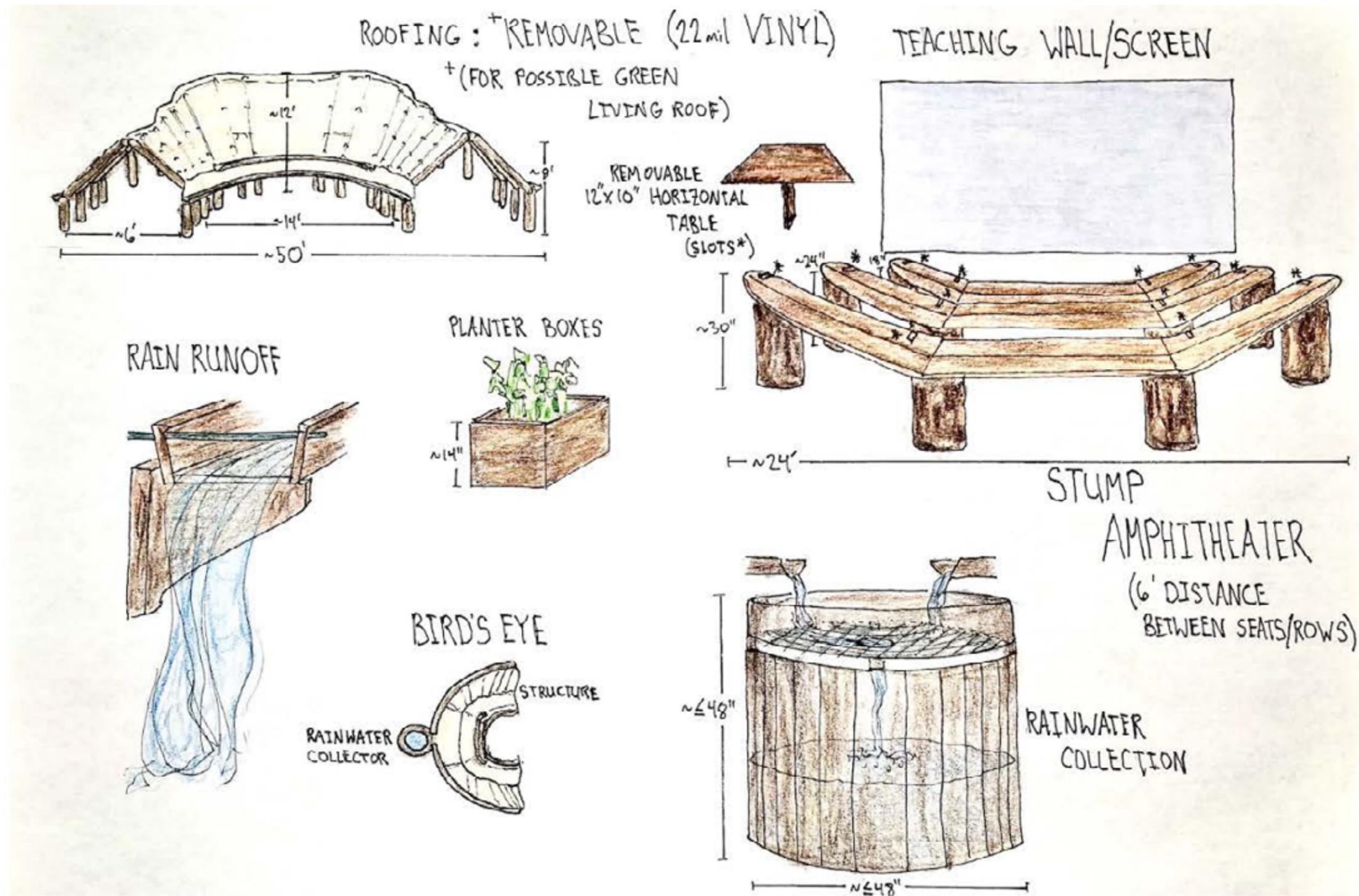
“Pretty interesting design using felled trees as the structure. Nice thought in detailing and instructions. Feels like something that would be pretty exciting for children to learn and play in.”



In submission to OUTSCHOOLED, I am including hand drawn images of vision for classroom space using recycled natural materials and construction elements below. Seen here is overlay of space with wood chip flooring for ADA access, supply storage, coat/jacket area, teaching wall, stump amphitheater, framing/roofing and planters outlined in subsequent images.



Structural Framework includes various lengths of tree logs ~8"-12" in diameter. Rebar pins and metal straps are used at every intersection. Concrete pads at base of each log post stave rot. Total space area 40'x30'x12' (LXWXH).



Vision develops teaching wall/screen and stump amphitheater with slotted insert areas for horizontal table tops, employing 6' of distance where students sit/learn/work. Planters in a hemispherical pattern around frontal log posts allow quick egress of space. Rainwater collection uses rain runoff in the back of outdoor space. Front structure partial runoffs into planters. The removable roofing allows for partial and/or whole GREEN living roof.



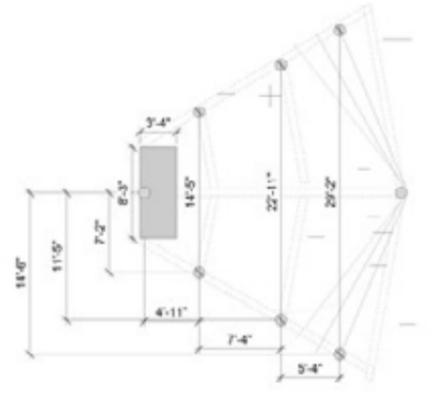


DESIGNER: **Andrea Mueller**  
 LOCATION: **Frankfort, Ky.**  
 TITLE: **“Wings” Outdoor Learning Space**

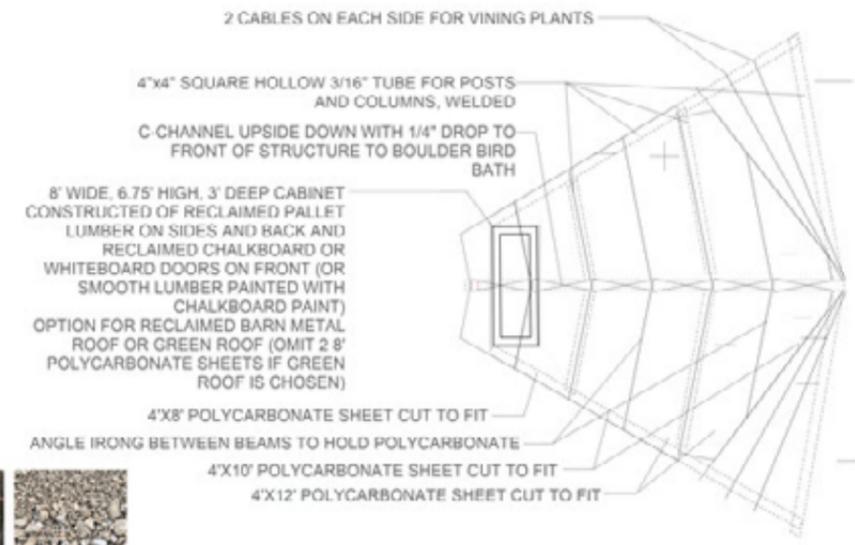
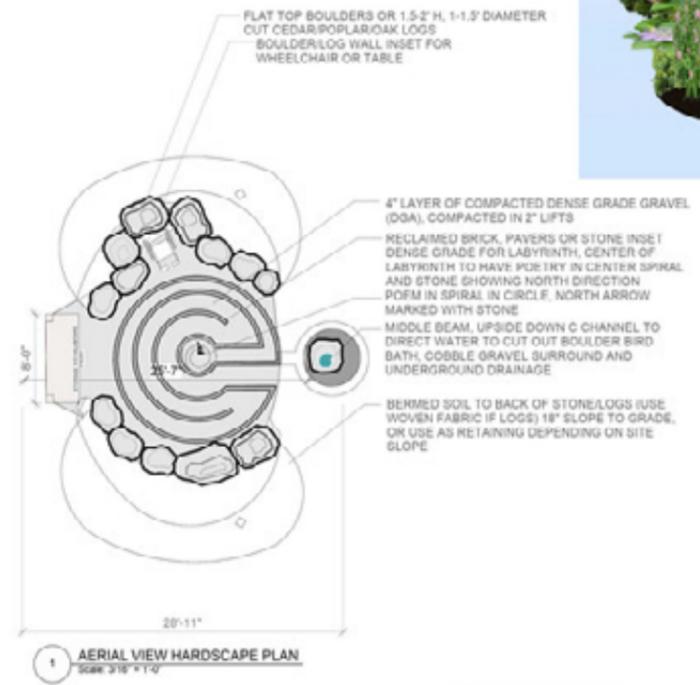
**What the jury said:**

“The landscaping is absolutely wonderful and very much of Kentucky, but could be adapted with different native plants in different locations. Its flexibility is also a strong suit.”

“A lot of attention paid to the plant material used. I like the overall design, particularly the mix of boulders and plant material to create an outdoor room. The roof structure is interesting and functional and likely doable for the budget. Sensory garden and labyrinth are nice features.”



2 AERIAL VIEW WING STRUCTURE FOOTERS  
 Scale: 3/16" = 1'-0"



BOULDERS, POLYCARBONATE SHEETS AND C CHANNEL (PROPOSED ROOF MATERIAL)



RECLAIMED PALLET LUMBER FOR EXTERIOR WALLS OF STORAGE UNIT AND RECLAIMED CHALKBOARD (SHOWN AS FLOOR HERE)



BOULDER BIRD BATH INSPIRATION IMAGES



4'x4" WEATHERED STEEL TUBE

OUTDOOR/EDUCATION  
 Outdoor Learning Space

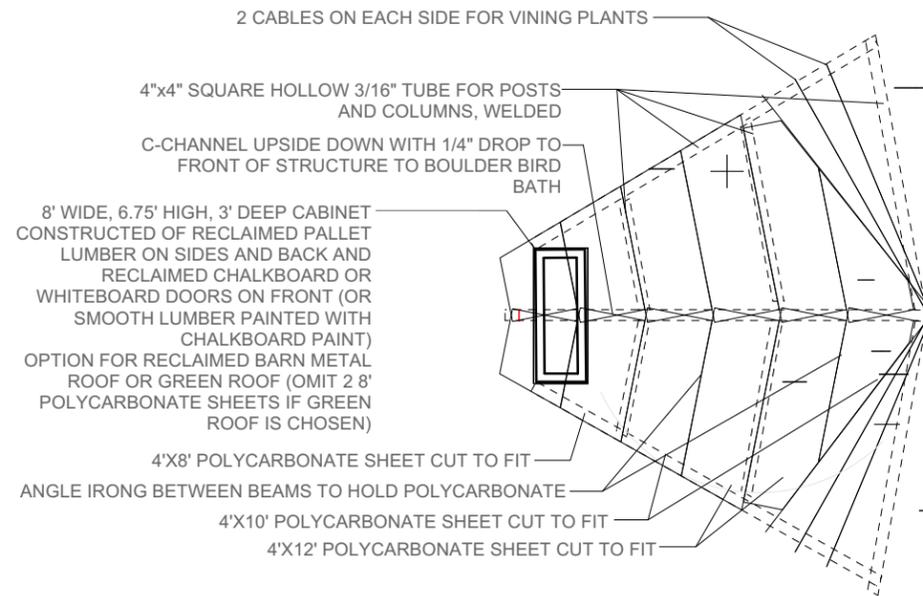
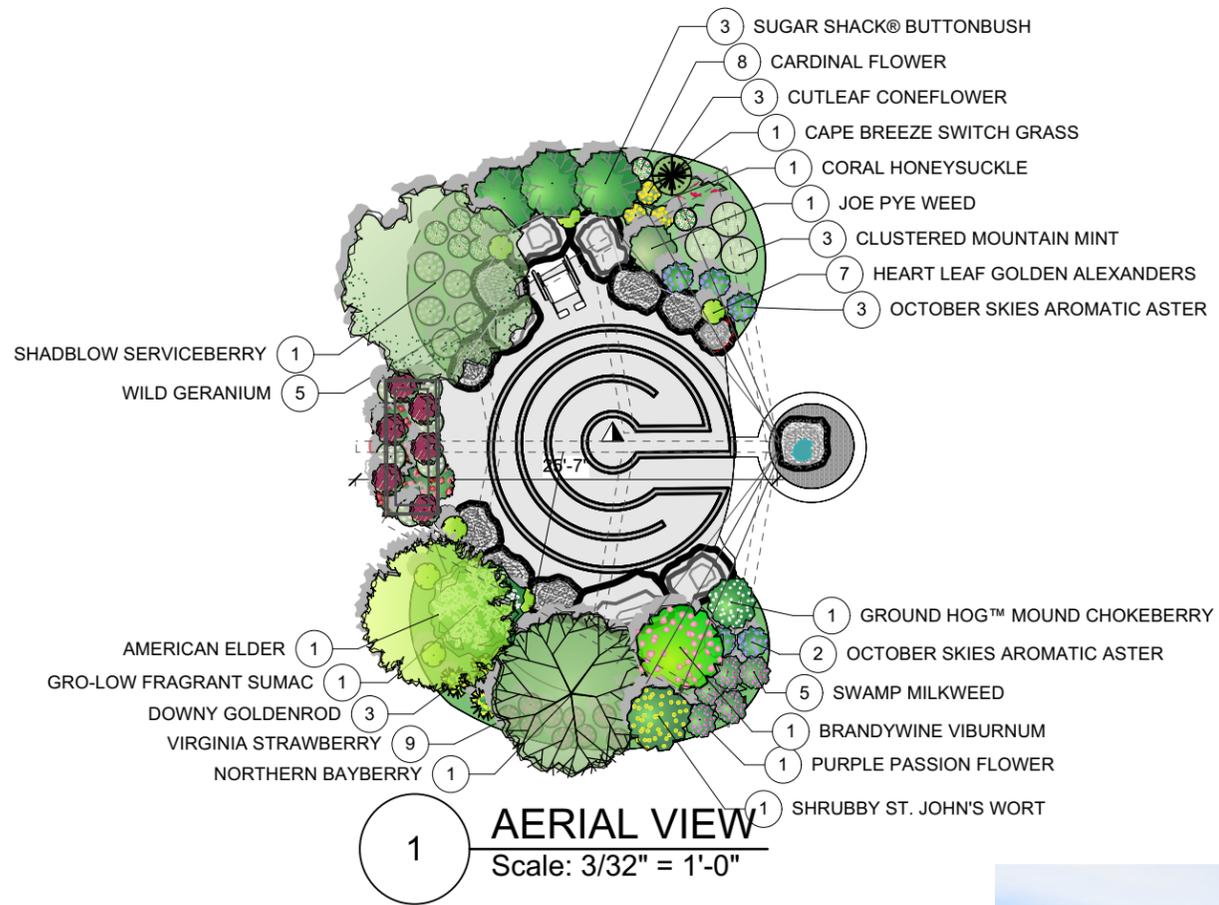
INSIDE OUT  
 LANDSCAPE DESIGN

DATE: 10/20/20  
 SHEET: 5

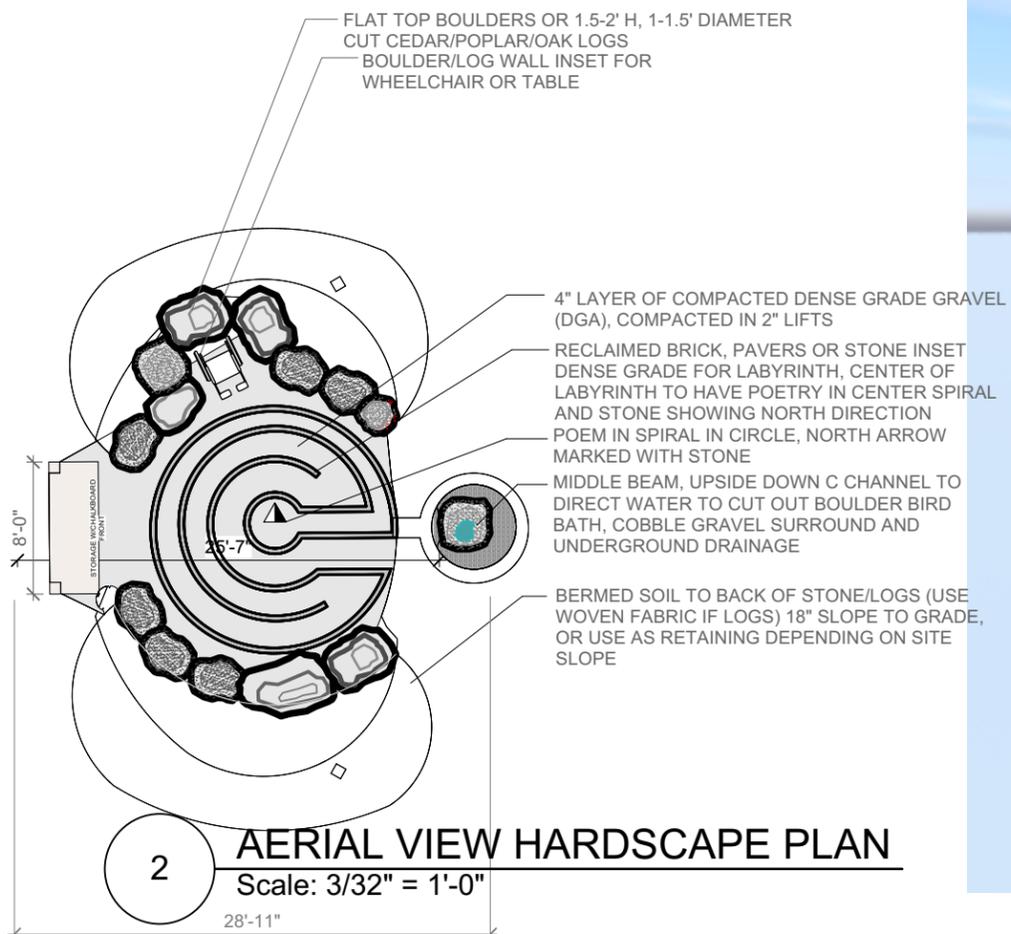
NOT FOR CONSTRUCTION BY OTHER MEASUREMENTS  
 ALL APPROVALS FROM CITY & LOCAL GOVERNMENTS

f i p in





**3 AERIAL VIEW WING STRUCTURE**  
 Scale: 3/32" = 1'-0"



100 OLD GEORGETOWN RD  
 FRANKFORT, KY 40601-8864  
 502.695.7020

OUTSCHOOLED

Outdoor Learning Space

www.kentuckylandscapedesign.com

DATE 2.12.2021

SHEET Sht-1



## Outdoor Classroom Materials Cost

	Supplier	Qty	Unit/Size	Cost Each	Ext. Cost
<b>STRUCTURES</b>					
<b>MAIN "WING" STRUCTURE</b>					
Metal for roof structure (lump sum - see attached materials sheet) (*metal prices are changing daily at this time)					
weathered steel 25' long C channel 6" offer c6 x 8.2 x 25ft	Central Steel Service, Pelham, AL	2	each	\$ 96.75	\$ 193.50
weathered steel 24' pieces 4"x4" hollow square steel tubing 3/16" wall	Central Steel Service, Pelham, AL	10	each	\$ 215.00	\$ 2,150.00
alternate: weathered steel 20' pieces 4"x4" hollow square steel tubing 3/16" wall	(could also do 8 20' and 2 24' instead of 10 24')				
weathered steel angle iron for support of poly carbonate	Arlo, Louisville, KY	2	each	\$ 65.00	\$ 130.00
plates and bolts	Arlo, Louisville, KY	8	each	\$ 15.00	\$ 120.00
Concrete/quickcrete footings	Quickcrete/Lowes	21	80lb	\$ 4.95	\$ 103.95
Polycarbonate roof and fasteners for structure	Premium Horticulture Supply, Louisville, KY				
4 4'x8' sheets		4	each	\$ 55.00	\$ 220.00
4 4'x10' sheets		4	each	\$ 65.00	\$ 260.00
4 4'x12' sheets		4	each	\$ 75.00	\$ 300.00
screws and H channel		1	each	\$ 40.00	\$ 40.00
Cable 30' weldless vinyl coated steel cable (for vines)	Lowes	1	each	\$ 10.00	\$ 10.00
<b>STORAGE UNIT</b>					
2"x4"x8' lumber (for storage unit)	Lowes	4	each	\$ 6.57	\$ 26.28
Reclaimed chalkboard or chalkboard paint and wood	Lowes (or free)	2	each	\$ 25.00	\$ 50.00
Reclaimed barn roof, flat sheet metal 8.5'x2.5' (or optional green roof, see below)	Reclaimed/found	1	each	\$ -	\$ -
Hinges, screws, misc	Lowes	1	each	\$ 10.00	\$ 10.00
<b>OPTIONAL STORAGE UNIT GREEN ROOF</b>					
2"x6"x8"		3	each	\$ 7.00	\$ 21.00
Pond liner 10'x3'		1	each	\$ 38.98	\$ 38.98
Green roof media		1	each	\$ 20.00	\$ 20.00
<b>HARDSCAPING</b>					
Cedar, Poplar, or Oak 1.5-2' h logs reclaimed (free and option to mix both)	Found/Reclaimed/Purchase from arborist	10	logs	\$ 5.00	\$ 50.00
Boulders for sitting and water collection, 10 boulders total, 1/2 ton each (if wall of all boulders, it is 7 tons total/add \$300.00 if additional monies are available)	Ohio Stone or Kentucky Cut Stone	5	tons	\$ 150.00	\$ 750.00
Woven Fabric	Site One or Lowes	0.5	roll	\$ 40.00	\$ 20.00
Inverted Spray Paint	Site One or Lowes	1	can	\$ 5.00	\$ 5.00
Reclaimed/found brick, pavers, cobble mosaic or stone for outline of labyrinth	Found/Reclaimed	90	pieces	\$ -	\$ -
DGA stone	Local quarry	7	tons	\$ 20.22	\$ 141.54
Cobble	Local quarry	0.5	tons	\$ 30.00	\$ 15.00

DESIGNER: **Andreea Paunescu,**  
**Bloom House Garden Design**  
LOCATION: **Bucharest, Romania**  
TITLE: **The Shell**

**What the jury said:**

“This is a fun and fanciful design that takes a lot of sustainability considerations into account. It looks like a place children would really enjoy being and there are a lot of inspiring ideas here.”

“I definitely like the idea of straw bail construction — would love to see them built.”









DESIGNER: **Nayeli Cerna**  
 LOCATION: **Xalapa Veracruz, Mexico**  
 TITLE: **The Cell**

**What the jury said:**

“The cellular basis that allows reconfigurations, different special arrangements and change out for new conditions is really well done. It would allow schools to make a small number, test them out, and then scale up once they have been evaluated. Low cost entry with possibility of build out in phases.”

“This design is attractive and bold, and it has some strong sustainability considerations.”

PLATES BUILT WITH RECYCLED METAL, MAKING THEM SEPARATELY ALLOWS THEM TO BE ADAPTED TO THE THICKNESS OF THE STRINGS THAT ARE IN STOCK. IT IS NOT THE SAME WIDTH OF A BAMBOO AS OF A WOODEN POLE, OR ANY OTHER MATERIAL THAT IS FOUND IN THE AREA.

WHICH THE FOUNDATION ARE PLATES, ALLOWS THAT THEY CAN SINK INTO THE EARTH, ALLOWING A GREATER GRIP AS WELL AS LEVELING THE STRUCTURE.

PLATES BUILT WITH RECYCLED METAL, WITH 3 HOLES FOR THE SCREWS THAT SUPPORT THE JOINTS.

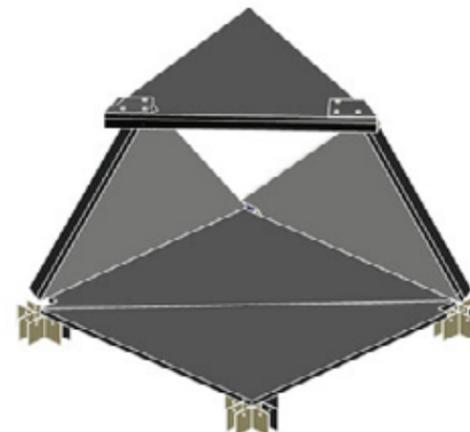
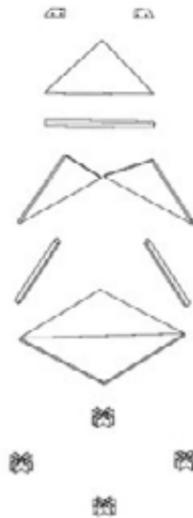
EACH TRIANGLE HAS THREE LAYERS:

INTERIOR: NATURAL FIBER FABRIC FROM THE REGION OR WOOD THAT CAN BE ENHANCED OR TREATED.

CENTRAL: RECYCLED CLOTHING FABRIC TO GIVE HEAT AND BE ABLE TO CONTAIN THE COLD WEATHER.

EXTERIOR: WATERPROOF WITH RECYCLED PLASTICS TO NOT ALLOW THE PASSI OF THE RAIN AND BE ABLE TO BE RECYCLED.

8 FEET LENGTH STRENGTH, OR ONE SIZE THAT EVERYONE WILL HOLD REGARDLESS OF THE WIDTH OF THE STRIPS, TO DO THIS, THE FOUNDATION PLATES ARE EXPANDED OR CONTRACTED.



THE INDIVIDUAL MODULE ALLOWS TO DISTRIBUTE THE NEO-SALON ON A PLOT HIGHLY SLOPED LIKE A MOUNTAIN. THIS MAKES THE CLASSROOM NO LONGER FIXED WITH CONCRETE TO THE FLOOR, NOW WE CAN TAKE THE STUDIO ANYWHERE OUTSIDE AND ATTACH TO THE GROUND WITH RAISED SLOPS. THIS ALSO WORKS AS A PLACE TO BE ABLE TO CRIMP SAFE AND RAISED FROM THE GROUND.

THE JOINT PLATES IN THIS MODULE ARE THE SAME AS FOR THE UNIT-MODULE, ONLY DIFFERENT HOLES ARE USED TO ANCHOR THE PIECES.

FOR A WARM WEATHER, THIS MODULE USES 4 METALLIC BASES, 2 UNION PLATES, 5 PREFABRICATED TRIANGLES AND 3 STRENGTHS.

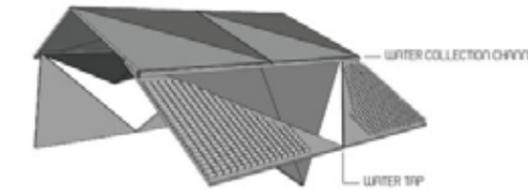
**CELL**

EACH MODULE HOUSES IS FOR FOUR PEOPLE, EXCEPT ONE THAT HOUSES 6 OR WITH THE POSSIBILITY OF BEING SEPARATE. THIS MODULE THINKS OF THE EQUIPMENT AS A MODE OF ORGANIZATION.

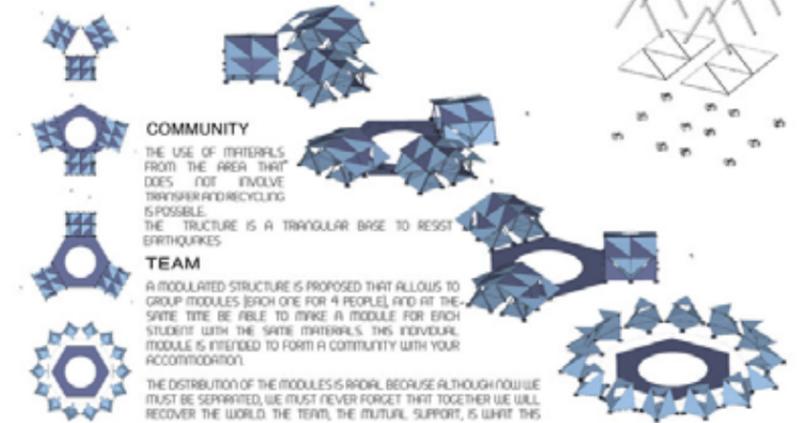
THE MODULE HAS AN OPEN INTERIOR CORRIDOR, WITHOUT A FLOOR, THIS WITH THE IDEA OF HAVING A GREATER CONNECTION WITH THE ENVIRONMENT, LEARNING TO VALUE THE FLOOR ABOVE THE EQU. AT THE SAME TIME THE INCLUDED WALLS CAN ALSO BE FOLDED TO GENERATE A GREATER CONNECTION WITH THE ENVIRONMENT. EVERYONE IS ONE STEP FROM FEELING THE GROUND, THE EARTH A ROOM THAT DOES NOT CONTAIN A ROOM THAT OPENS UP TO THE WORLD. THIS MODULE IS MADE UP OF 4 METALLIC BASES AS A FOUNDATION, 2 BEAMS, 6 UNION PLATES, AND 16 PREFABRICATED TRIANGLES.



THE SLOPED ROOF ALLOWS THE COLLECTION OF PLUVRIL WATER, THE ROOF, LIKE THE WALLS, ARE MADE OF PREFABRICATED TRIANGLES THAT ALLOW IT TO OPEN AS WINDOWS FOR GREATER CONNECTION WITH THE IMMEDIATE ENVIRONMENT.



RAINWATER COLLECTION SYSTEM THAT IS TRANSPORTED TO ALUMINUM CANS, INSIDE THEM A BLACK HOSE THAT STORES AND MAINTAINS HOT WATER.



**COMMUNITY**

THE USE OF MATERIALS FROM THE AREA THAT DOES NOT INVOLVE TRANSPORT AND RECYCLING IS POSSIBLE.

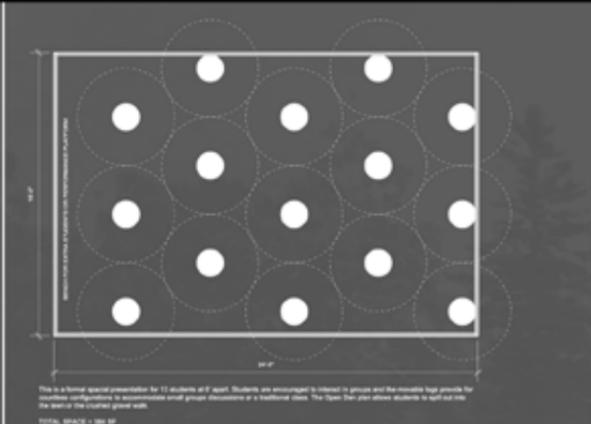
THE STRUCTURE IS A TRIANGULAR BASE TO RESIST EARTHQUAKES.

**TEAM**

A MODULAR STRUCTURE IS PROPOSED THAT ALLOWS TO GROUP MODULES EACH ONE FOR 4 PEOPLE AND AT THE SAME TIME BE ABLE TO MAKE A MODULE FOR EACH STUDENT WITH THE SAME MATERIALS. THIS INDIVIDUAL MODULE IS INTENDED TO FORM A COMMUNITY WITH YOUR ACCOMMODATION.

THE DISTRIBUTION OF THE MODULES IS RADIAL, BECAUSE ALTHOUGH NOW WE MUST BE SEPARATED, WE MUST NEVER FORGET THAT TOGETHER WE WILL RECOVER THE WORLD. THE TEAM, THE MUTUAL SUPPORT, IS WHAT THIS





Seating Plan @ 6' Apart  
Scale: 1/4" = 1'-0"

# OPEN · DEN

designed and documented by kyle O. seave

## OPEN DEN MATERIAL COST ESTIMATE

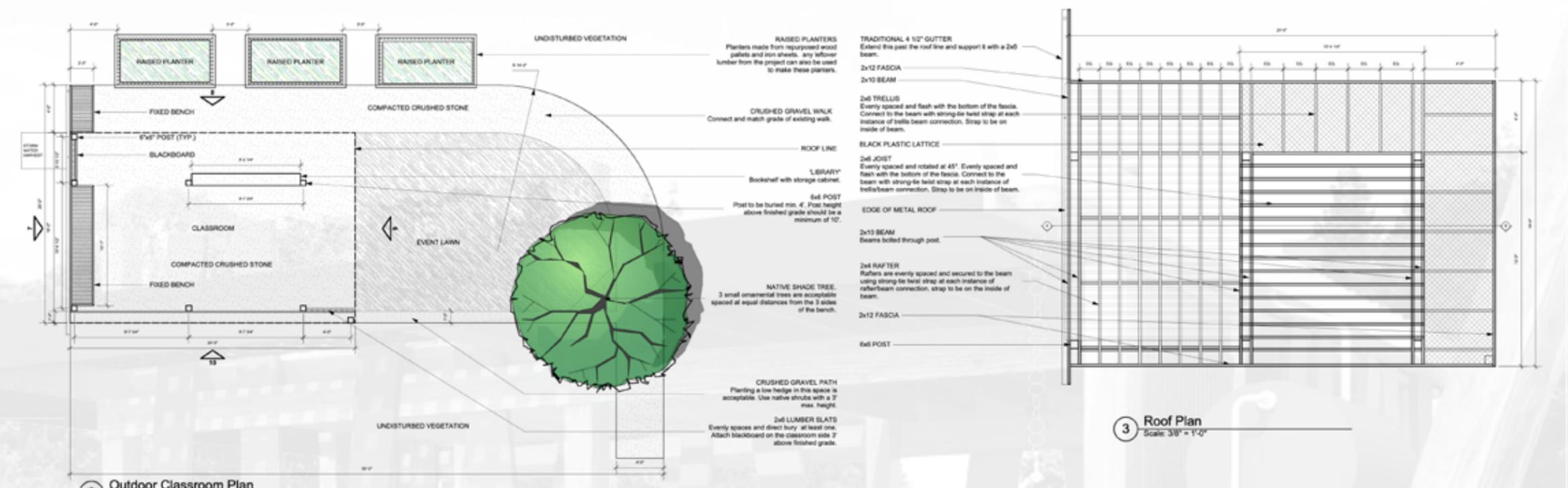
### DEN STRUCTURE (All Den Structure To Be New Lumber)

QTY.	ITEM	UNIT \$	TOTAL \$
7	2"x4"x10' Lumber	\$9.98	\$69.86
9	2"x6"x8' Lumber	\$12.27	\$110.43
22	2"x6"x10' Lumber	\$15.57	\$342.54
9	2"x6"x16' Lumber	\$25.77	\$231.93
6	2"x8"x16' Lumber	\$23.82	\$142.92
8	6"x6"x16' Posts	\$69.74	\$557.92
5	2"x12"x16' Lumber	\$51.60	\$258.30
<b>FRAMEWORK SUBTOTAL</b>			<b>\$1,713.90</b>
4	4'x8' Lattice	\$11.97	\$47.88
9	10' Metal Roof Panel	\$15.35	\$138.15
2	10' Vinyl Gutter	\$4.16	\$8.32
1	Set K-Style End Cap	\$8.71	\$8.71
<b>ROOFING MATERIAL SUBTOTAL</b>			<b>\$203.06</b>
684SF.	Crushed stone	\$2.50/SF.	\$1,710.00
20'	Round Smooth Log	\$6.99/LF	\$139.80
1	Wood Sealant	\$34.98	\$34.98
2	55 Gal Barrel	\$44.50	\$89.00
3	Cement Backerboard	\$14.28	\$28.56
1	Chalkboard Paint	\$10.98	\$10.98
1	1/2"x4"x8' Plywood	\$53.98	\$53.98
1	Fasteners & Plumbing	\$202.34	\$202.34
<b>MISCELLANEOUS ITEMS SUBTOTAL</b>			<b>\$2,269.64</b>

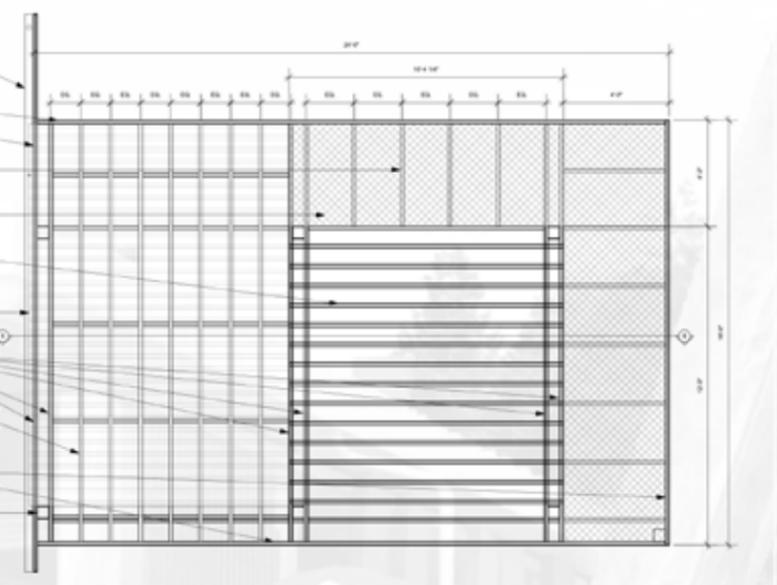
### REPURPOSED MATERIAL (Source: Habitat for Humanity Restore)

15	2"x6"x10' Lumber	\$7.50	\$112.50
13	2"x8"x10' Lumber	\$12.50	\$162.50
9	2"x10"x10' Lumber	\$13.50	\$121.50
6	4"x4"x8' Posts	\$4.50	\$27.00
5	2"x12"x10' Lumber	\$18.50	\$92.50
<b>REPURPOSED MATERIAL</b>			<b>\$423.50</b>

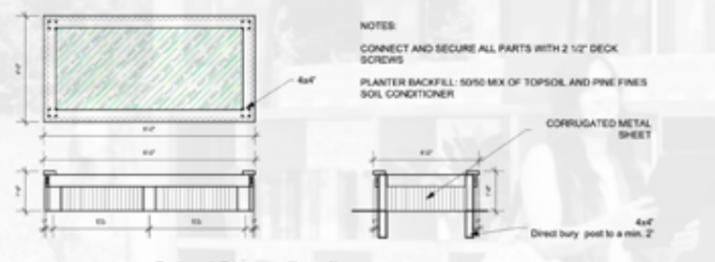
Repurposed material to be used only for raised planters and pickets. All



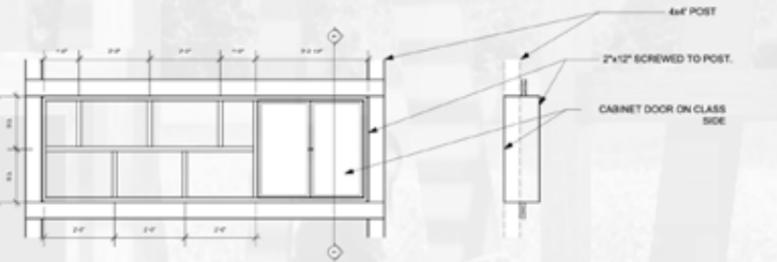
Outdoor Classroom Plan  
Scale: 1/4" = 1'-0"



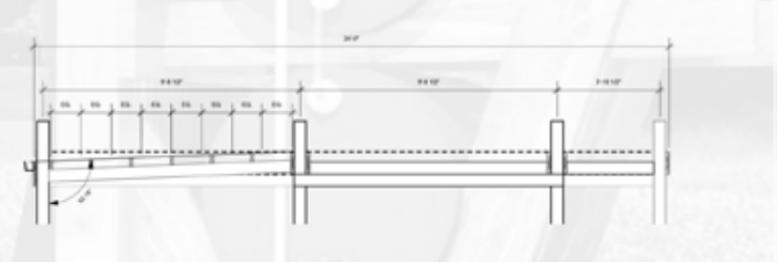
Roof Plan  
Scale: 3/8" = 1'-0"



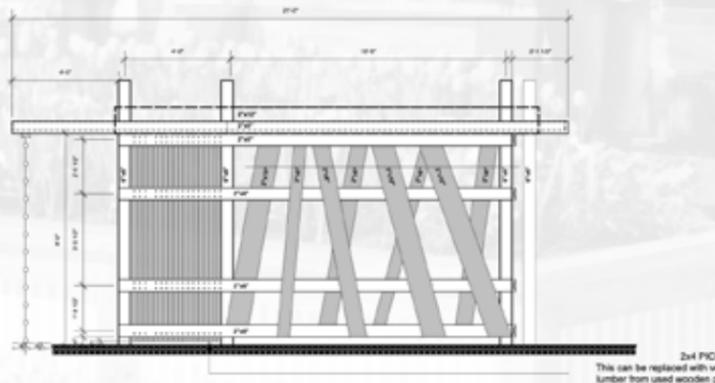
Raised Planter Details  
Scale: 3/8" = 1'-0"



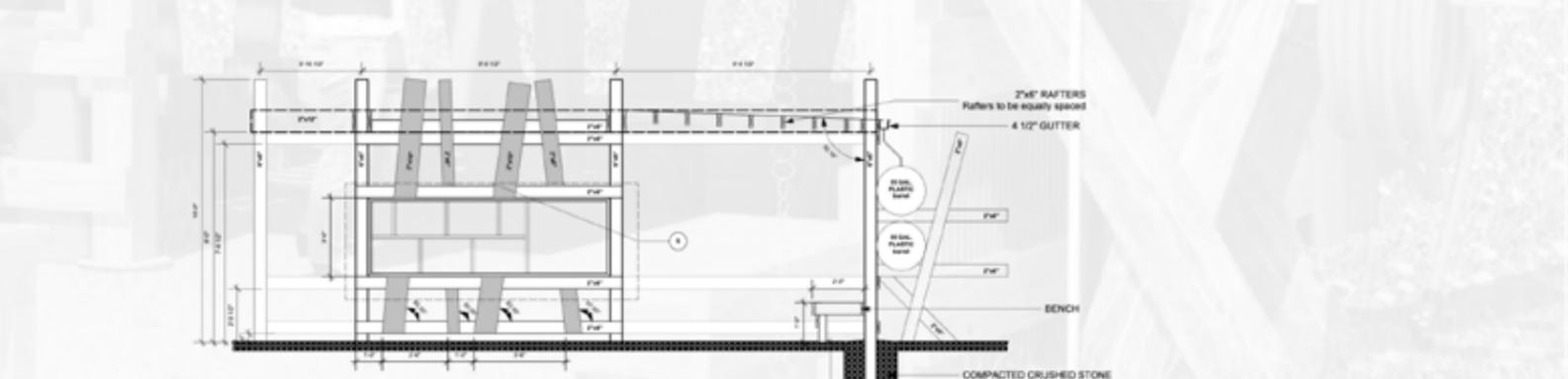
Shelf & Storage Details  
Scale: 1/2" = 1'-0"



Roof Section  
Scale: 3/8" = 1'-0"



Wall Elevation 7  
Scale: 3/8" = 1'-0"



Wall Elevation 8  
Scale: 3/8" = 1'-0"

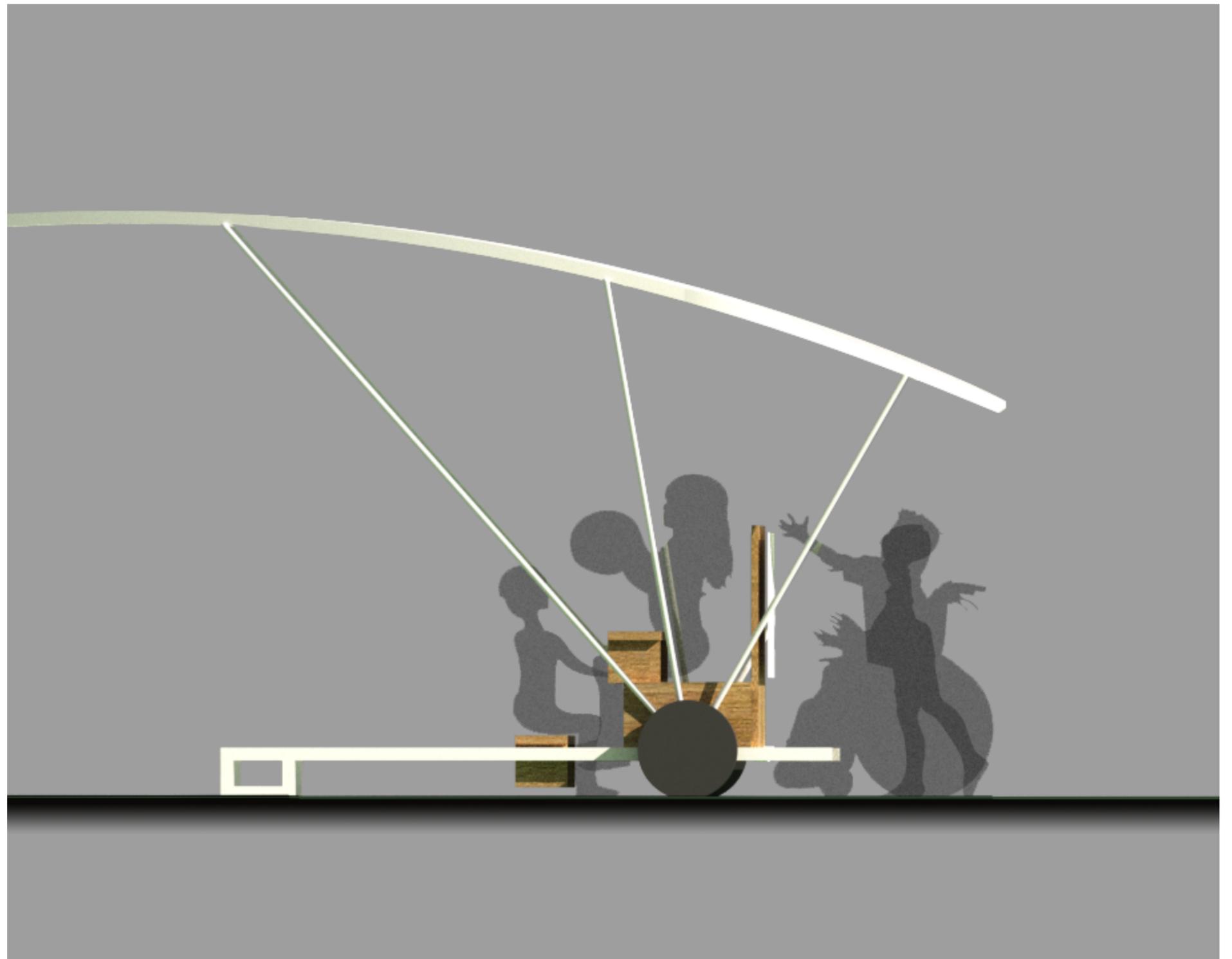
DESIGNER: **SNDBX Design Collaborative: Christopher Manzo, AIA; Billy Boyd, AIA; Anna Finneran, AIA; Ron Peron, PE**

LOCATION: **Louisville, Ky.**

**What the jury said:**

“This design really made me smile — it’s so simple and incredibly original, and fun.”

“I was immediately captivated by this proposal and the unconventional route of creating individual pods.”



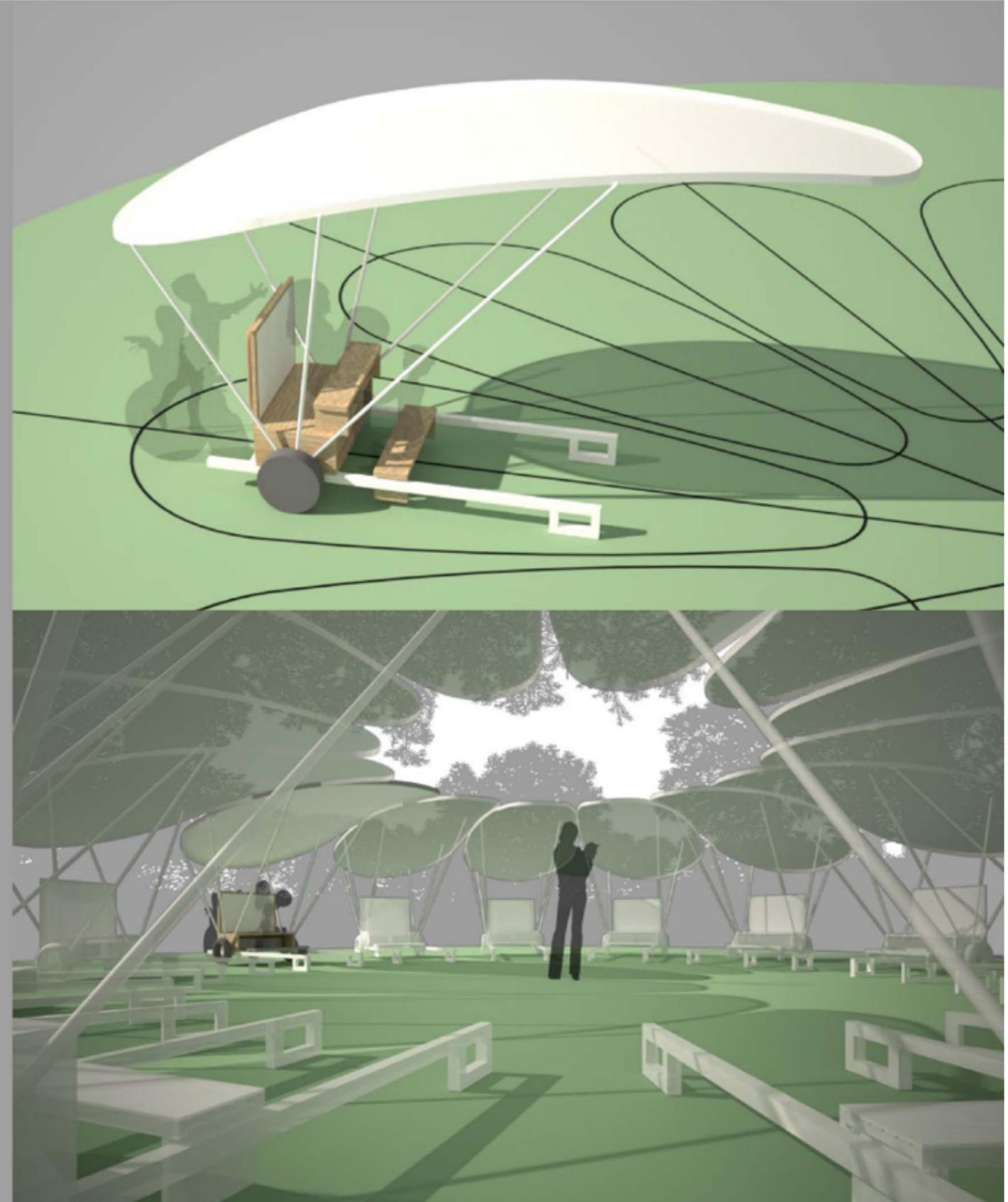


## THE DISCOVERY & EXPLORATION WAGON -

The mobile Discovery & Exploration Wagon (D.E.W. Drop) is capable of being set up under a variety of outdoor scenarios: parking lot, prairie field, forest clearing, or school yard. D.E.W. Drops are the ultimate in flexible outdoor classroom design! Made of over 90% recycled material, the Drop folds up and packs tight for easy off-season storage. Each Drop is fully accessible for children of all ages and bodies. Drops come in a typical children's unit and a modified instructor's unit, each of which is light enough for an adult to set up.

## INDIVIDUALS. TOGETHER -

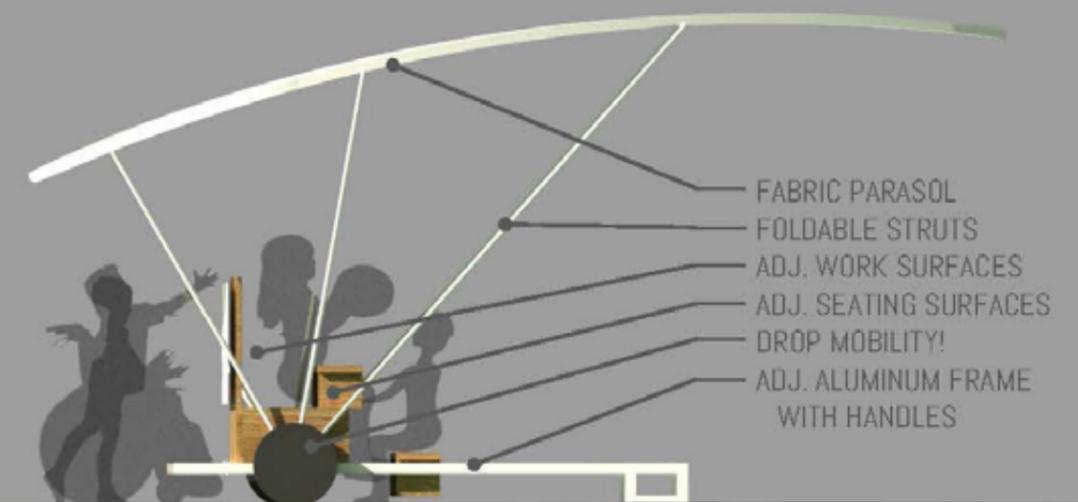
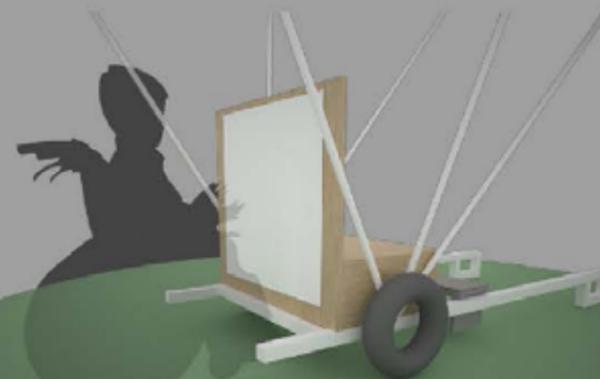
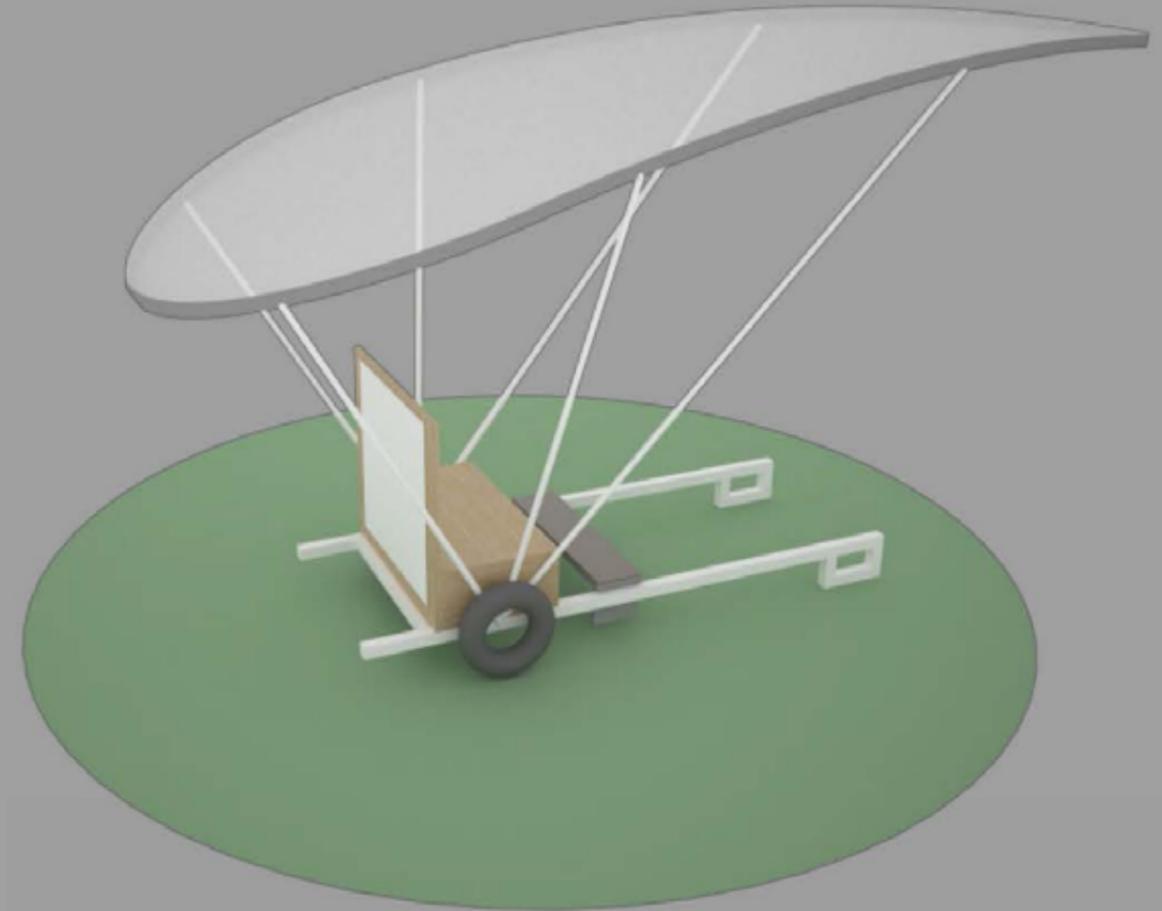
Together, D.E.W. Drops form a sheltered outdoor workspace capable of holding small to medium sized classes of 2-13 children socially distanced, plus an instructor or two. Groups can be broken out as needed into smaller pods or brought together to form a single larger outdoor classroom.



# FEATURES OF THE D.E.W. DROP -

A D.E.W. Drop provides each student with a unique and safe micro-climate for outdoor play, learning, and creativity. A Drop can be outfitted with several storage and work surfaces to meet changing educational requirements. These 'sitting' surfaces (crawling, wheeling, standing, or resting) and work surfaces (writing, painting, computing, reading, and drawing) can be easily adjusted in height and location to meet differing age and ability needs. Each Drop is universally designed to childhood ADA guidelines and can easily accommodate wheelchairs and walkers.

The Drop's main parasol can be adapted to address differences in sun, wind, and rain direction. It's open, petal-like design provides each student with ample ventilation, light, and 360d views of their classmates, instructor, and nature. The Drop's parasol provides both shade and a dry micro-space for students to learn, play, and create. Each parasol's graphic design will vary and incorporate color, form, and references from nature – all designed by children working with local artists! Each D.E.W. Drop can be painted a different color to create a bright collage of objects set in nature.



# TEACHERS' DROP -

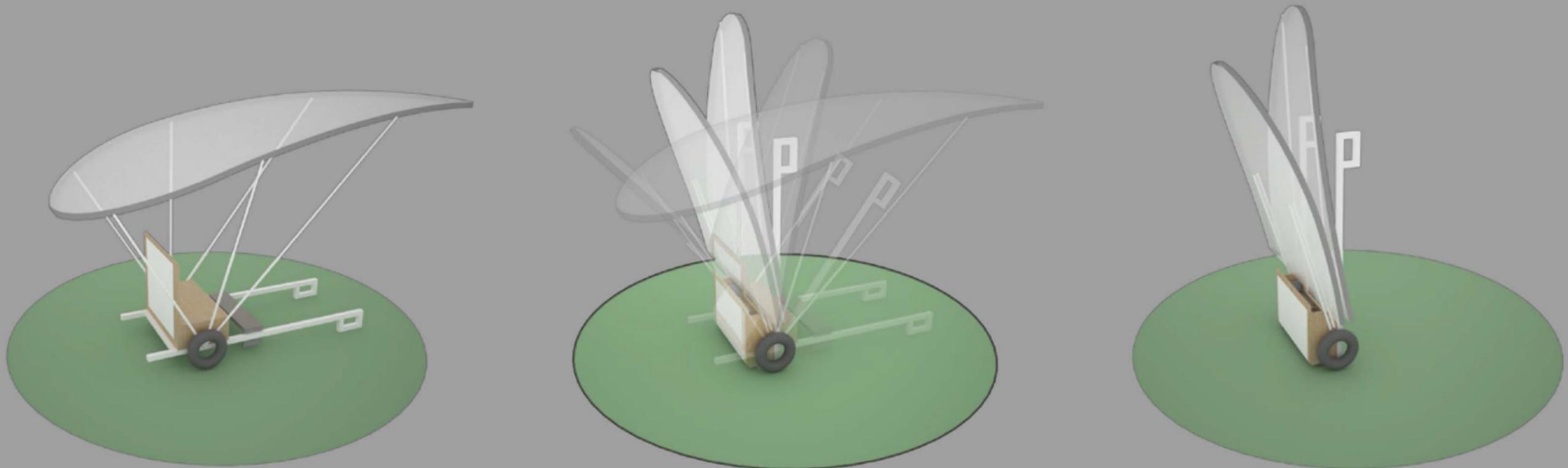
In addition to the standard child unit, D.E.W. Drops come in a modified unit for teachers to present material. The presentation, or teacher's Drop, has flexible vertical writing surfaces, potential space for projection or exhibition, and increased storage space. The final design of this unit is intended to be further refined with direct input from a community of local outdoor educational teachers.



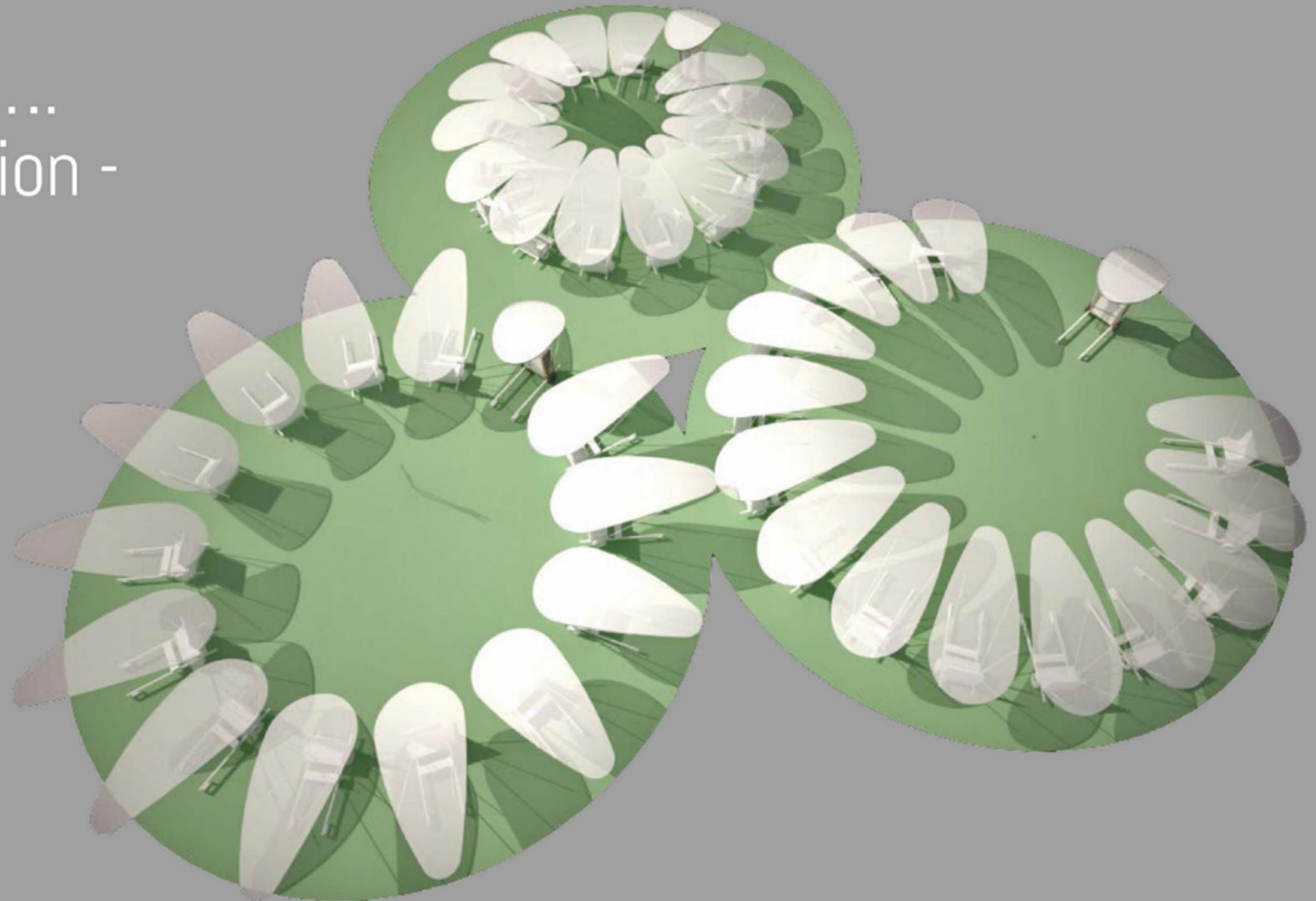
# SUSTAINABILITY & COSTS -

The D.E.W. Drop frame is constructed of re-purposed lightweight and sturdy aluminum bleacher material (seats and struts) – used material commonly found at most schools. The frame is assembled using off-the-shelf hardware and can be easily broken down for storage or repair. The parasol is fabricated from recycled mylar and fabric – materials commonly found in banners and oversized printing. Additional recycled components will come from used bicycles, children's bicycle trailers, and storage box materials. Fabrication will be a COMMUNITY effort between elementary children in conjunction with JCPS engineering and fabrication classes, local awning fabricators, maker spaces, the design team, local teachers, and regional print artists.

D.E.W. Drops are made of over 90% recycled/ found/ reused materials. Each Drop has an estimated \$350/ unit material cost. Drops are site adaptable to accommodate a variety of outdoor terrain conditions and are easily moved or stored. And like a drop of dew in the grass, the D.E.W. Drop treads lightly on the earth without any permanent structure.



D.E.W. DROPS....  
Outdoor Education -  
Anywhere,  
Anytime,  
Anyone!



**DESIGNER: Eric Whitmore, AIA;  
Anna Triplett, AIA; Paul Toenjes,  
ASLA; and Molly Meyer**  
**LOCATION: Louisville, Ky.**  
**TITLE: Bernheim Grow Pods/  
Bernheim Classrooms**

**What the jury said:**

“I love the simplicity, but what I like most is the anticipatory design that acknowledges that there will be a lot of used clear plexi in our future as all the shields around points of purchase disappear.”

“I love the form and the materials for this concept, and the idea of it being a movable structure that takes advantage of existing tree canopy is great.”



# OUTSCHOOLED Growing Outdoor Classrooms

## DESIGN NARRATIVE

*Bernheim Arboretum and Research Forest* defines the spirit of learning by connecting people to nature. Nestled in the hills of Clermont, Kentucky, visitors utilize this as a place of learning through exploration and discovery of the natural environment. Growing this mission in the arboretum, as well as in spirit in neighboring areas. In addition, Bernheim's support for *Biophilia* will continue to impact students in a positive way. Connecting to nature is proven to help students reduce stress, improve self-control and self-discipline, and promote physical and psychological health.

Outdoor classrooms are even more important in today's schools and communities. A response to help students and communities regain identity and contact through nature is an important human solution with diverse benefits, when designing for a post-pandemic world. Structuring new learning environments with better access to light, air, and outdoor space can be an effective way for students and teachers to reconnect to nature, and each other.

Two flexible, yet inexpensive approaches to the *Outschooled Growing Classrooms* are utilizing the natural surrounding for walls and roofs (or growing them!), applying inexpensive chip bark mulch as a floor and simple logs as seating and surfaces. These scalable options allow Bernheim to be inclusive to a larger community by allowing students in various circumstances the opportunity to learn and be enveloped by nature.

## DESIGN GOALS

These two solutions provide:

- A scalable solution for outdoor classrooms to be implemented in various locations throughout the arboretum
- A learning environment for up a teacher and 13 students with social distancing
- Open air classrooms that utilize the natural surrounding
- A focal wall that can provide a teaching surface, display area, and storage
- Re-used personal protection equipment (PPE) as writing slates, and displays

### 1 BERNHEIM CLASSROOMS

Site-specific to Bernheim these outdoor classrooms use natural elements of the forest to envelop students as they learn. Lightweight, modular and expandable as needed for changing instruction needs.

### 2 BERNHEIM GROW PODS

These growing outdoor classrooms bring natural elements to a urban sites to provide a learning space amongst nature.



Growing the Bernheim mission through connection to nature



## CONTRIBUTORS

Anna Triplett, AIA Paul Toenjes, ASLA Molly Meyer Eric Whitmore, AIA

## DESIGN ELEMENTS

1

Focal wall lattice metal or wood frame anchored to ground and tethered between surrounding trees

2

Chip bark mulch bed from locally-sourced wood



3

Locally-sourced wood log or flat stone bench



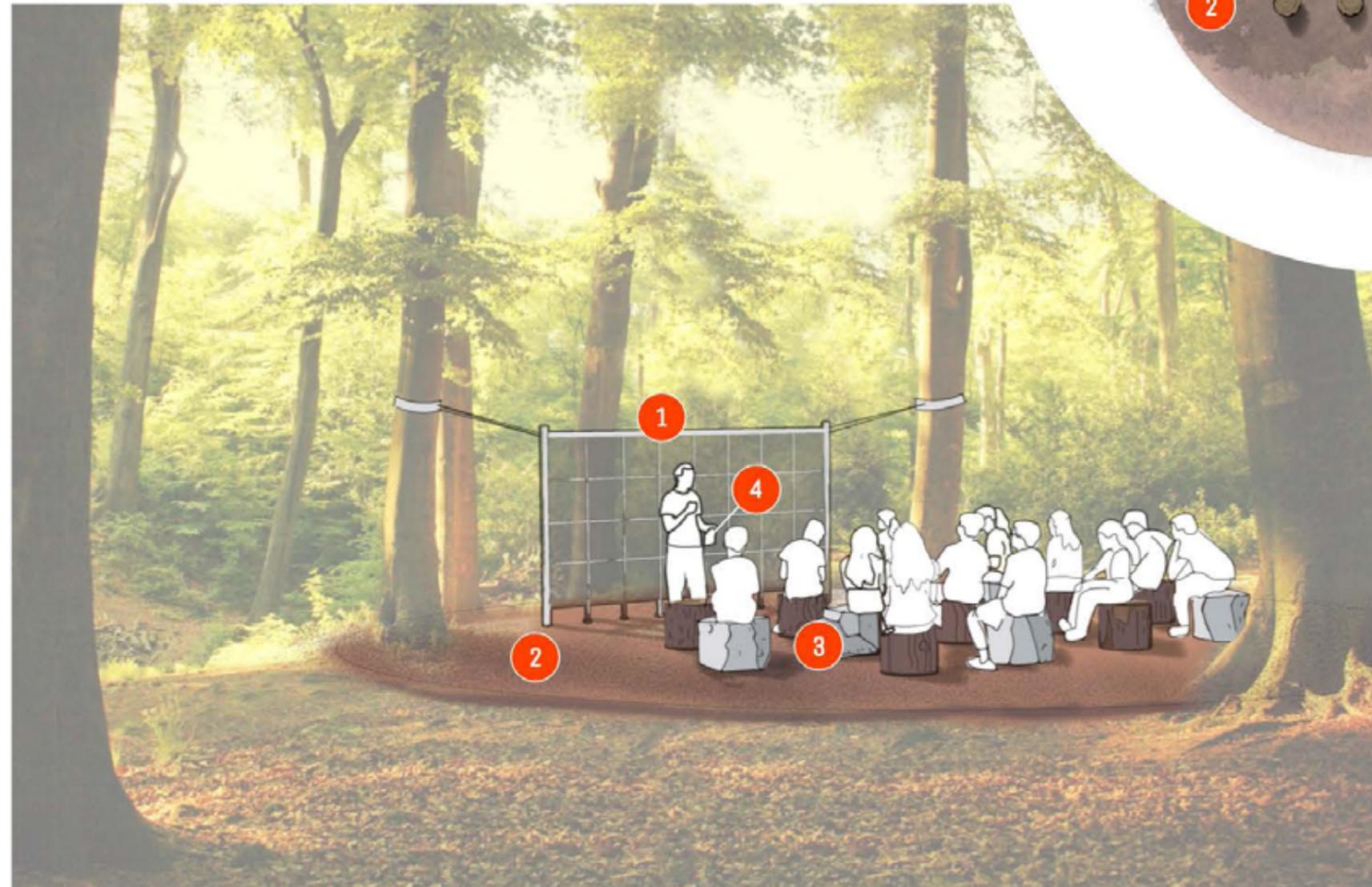
4



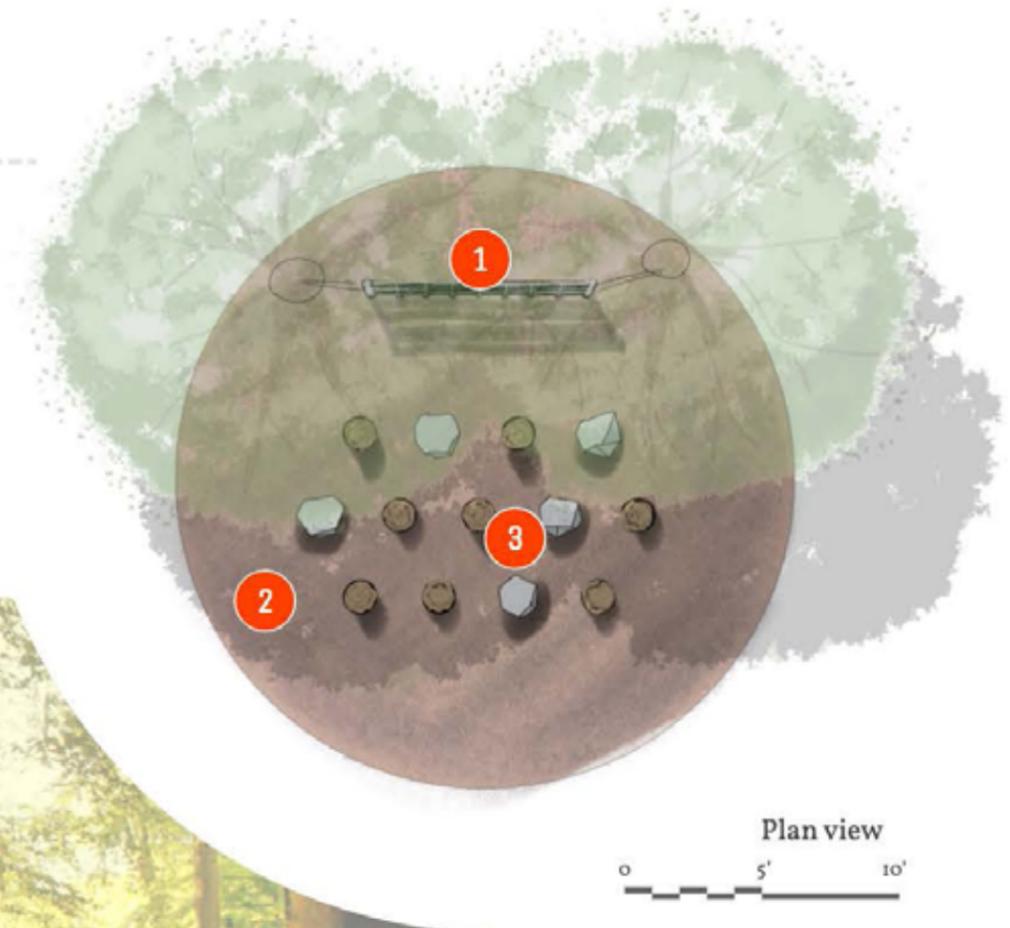
Re-used PPE equipment as writing slates or clipboard

## BERNHEIM CLASSROOMS

Transportable, easy-to-use focal walls can be located in various locations throughout the arboretum and research forest. The classroom will be beneath a canopy of existing foliage and fully embrace its natural surroundings. This approach is not to confine teachers and students in a built environment, but a found outdoor room that is waiting to be discovered.



Perspective view



Plan view  
0 5' 10'

## DESIGN ELEMENTS

1

Focal wall lattice metal or wood frame anchored to ground and tethered and tethered to posts rising out of the planters.

2

Chip bark mulch bed from locally-sourced wood

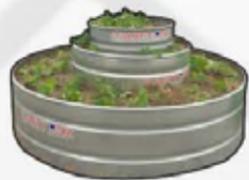
3

Locally-sourced wood log or flat stone bench

4

Re-used PPE equipment as writing slates or clipboard

5



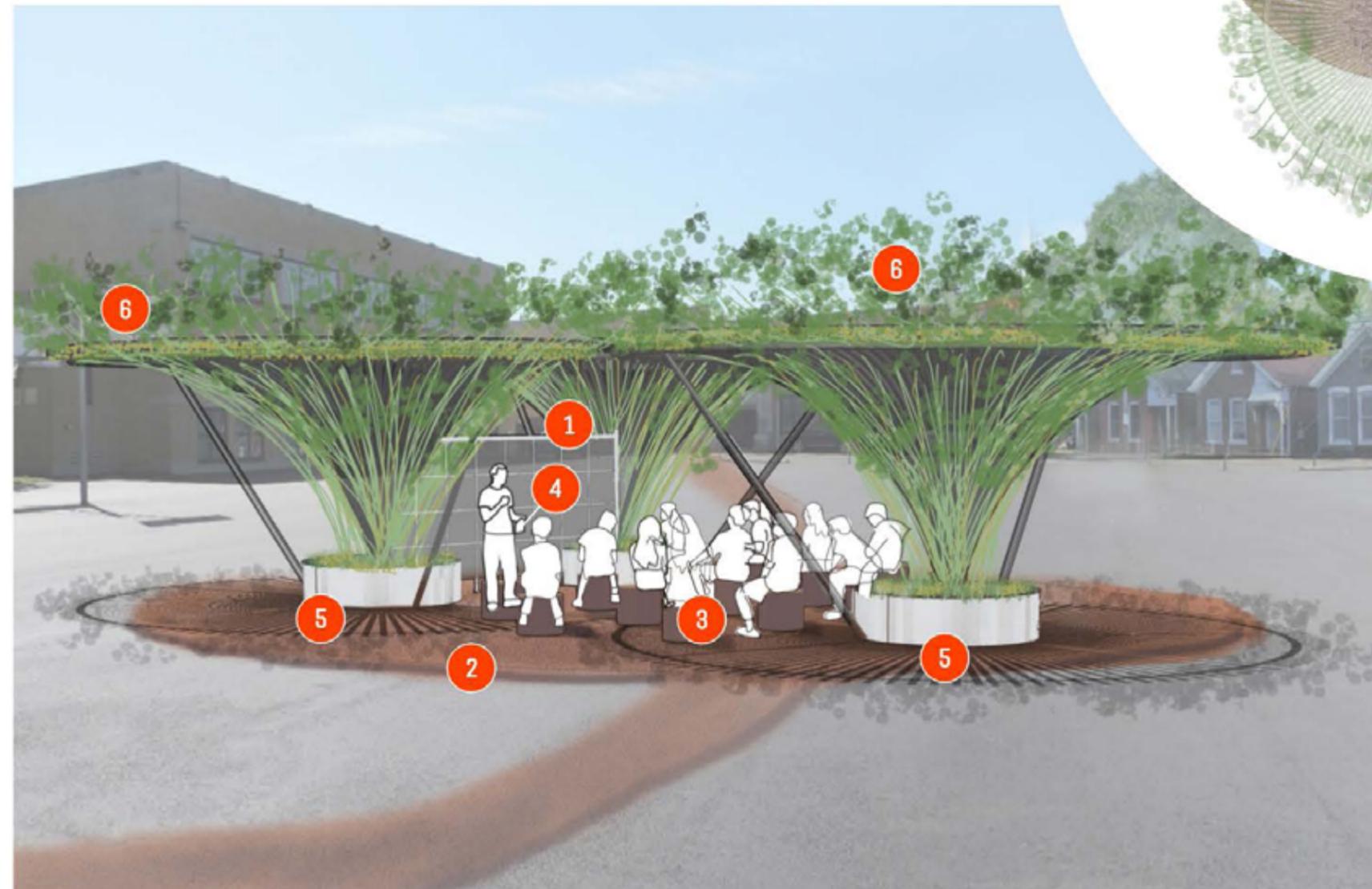
Livestock trough with drainage holes, ballast and soil for plant growth and rain water collection

6

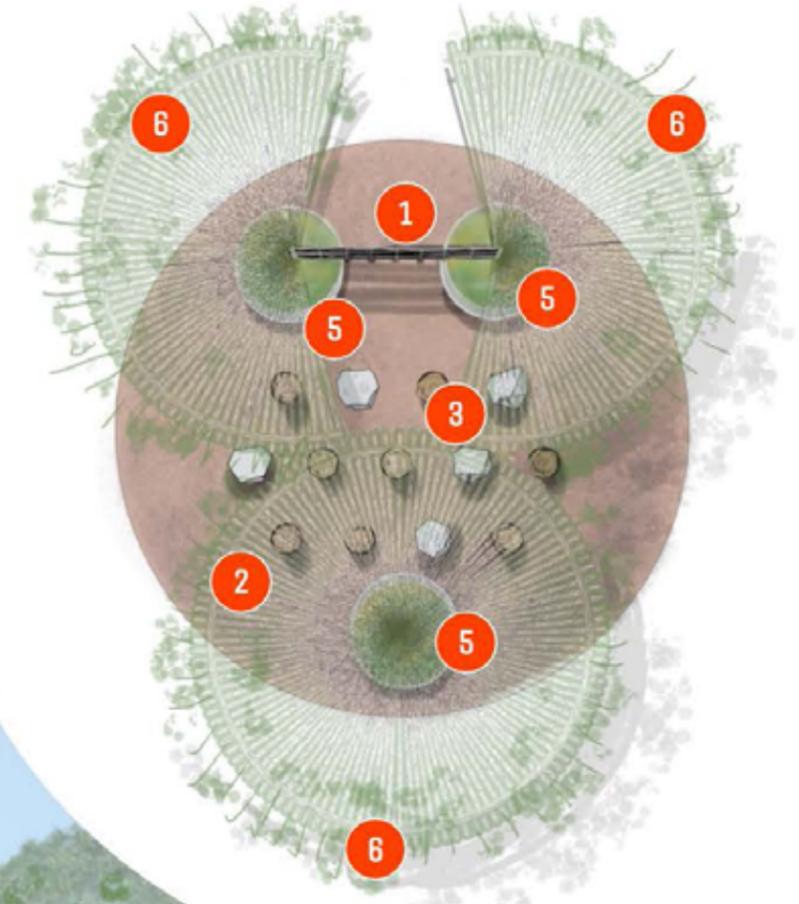
Fast-growing, trained bamboo for canopy ceiling and creating zones of space

## BERNHEIM GROW PODS

To expand the original concept and to expose other communities to the Bernheim mission, new *Grow Pod* outdoor classrooms can be installed with the same frame focal wall, chip bark floor, log seating and re-used PPE slates. Additionally, a new canopy of fast-growing bamboo can be trained to create multiple outdoor rooms for teaching, exploring and expanding a school's footprint to an underutilized portion of a site.



Perspective view



Plan view



## THE FOCAL WALL

The focal wall is designed to be an ever-changing learning display promoting discovery and creativity. The wall can become a teaching source or it can become an installation showcasing art and writing or natural discoveries. For example, below are two panel options for the wall. Removable panels attach to the framework of the wall via clips. These panels could utilize PPE plexiglass as a surface for display, teaching or capturing mementos of the surrounding area.

A focal wall panel could utilize PPE that has been used for COVID protection but need a new purpose after restrictions have been lifted. These panels could become clipboards or writing surfaces. For example, students may hold them up and trace trees, draw images, paint, or write poems or observations.

Other panels could be wood frames with hemp twine openly woven within them. These allow for the collection of natural elements found on the way to the classroom to be used for 'nature weaving' and display upon the wall. A third removable frame would include a storage pocket for classroom materials and collecting.

In addition to using the focal wall in the classrooms, these installations could be placed throughout the Arboretum or even in parks around the city. For example, at Bernheim, when the Forest Giant installations leave, there will be voids in the landscape. These locations could be great spaces for such a wall as majority of visitors already know the paths to these locations. Families could pick up panels at the visitor's center and gather items on the way to the wall, leaving their "footprints" for others to find.



Focal wall front perspective

## BERNHEIM AND BEYOND

The *Outschooled Growing Outdoor Classrooms* will take root in *Bernheim Arboretum and Research Forest*, but spread the spirit of learning and returning to nature throughout Kentucky communities. A vast array of opportunities abound by utilizing simple techniques and materials that can help define special places in the forest and locations that will grow their own identities and connections.



Bernheim Map

## CLASSROOM COMPONENTS

The classroom consists of sustainable and cost effective components that create an outdoor learning center on various sites. The following cost opinion shows how these components can come together in dynamic ways:

1	Cable Wall with Donated PPE	1	\$1,500.00	\$1,500.00
2	Bamboo Plants	9	\$50.00	\$450.00
3	Training Ropes and Ties	1	\$300.00	\$300.00
4	Galvanized Trough (8' diameter x 3' tall)	3	\$550.00	\$1,650.00
5	Planter Soil	15	\$35.00	\$525.00
6	Organic Mulch	8	\$45.00	\$360.00
7	Log Seats and Rocks	13+	\$0.00 (Donated)	\$0.00 (Donated)
<b>Total</b>				<b>\$4,785.00</b>

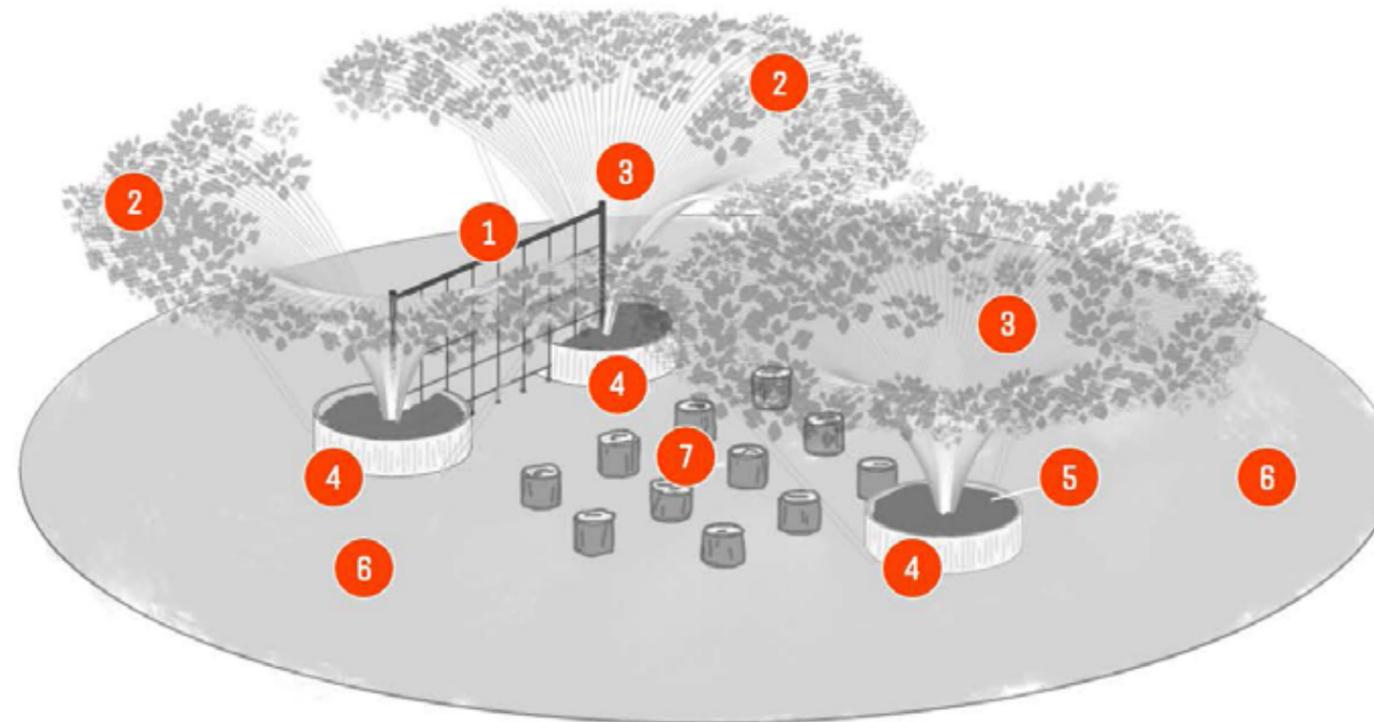


Diagram of Grow Pod Classroom

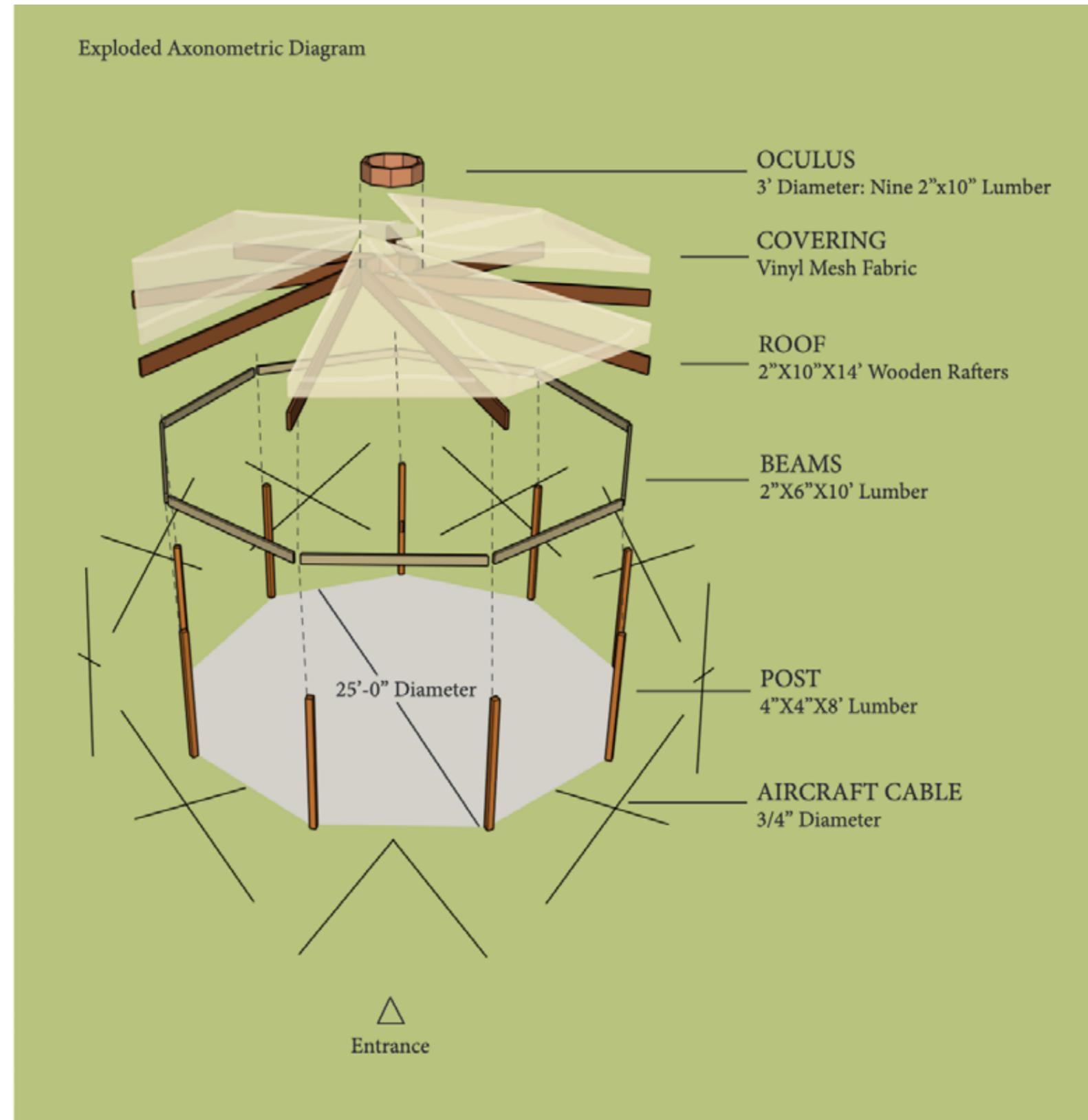
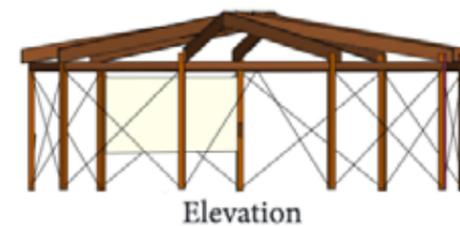
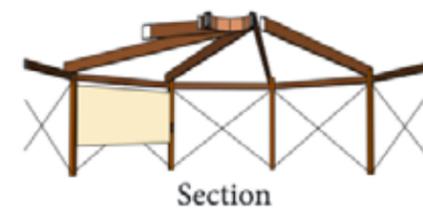
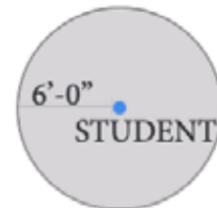
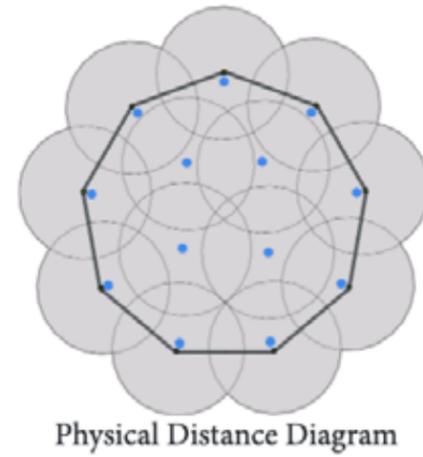
**AWARD: FIRST PLACE,  
UNIVERSITY CATEGORY**

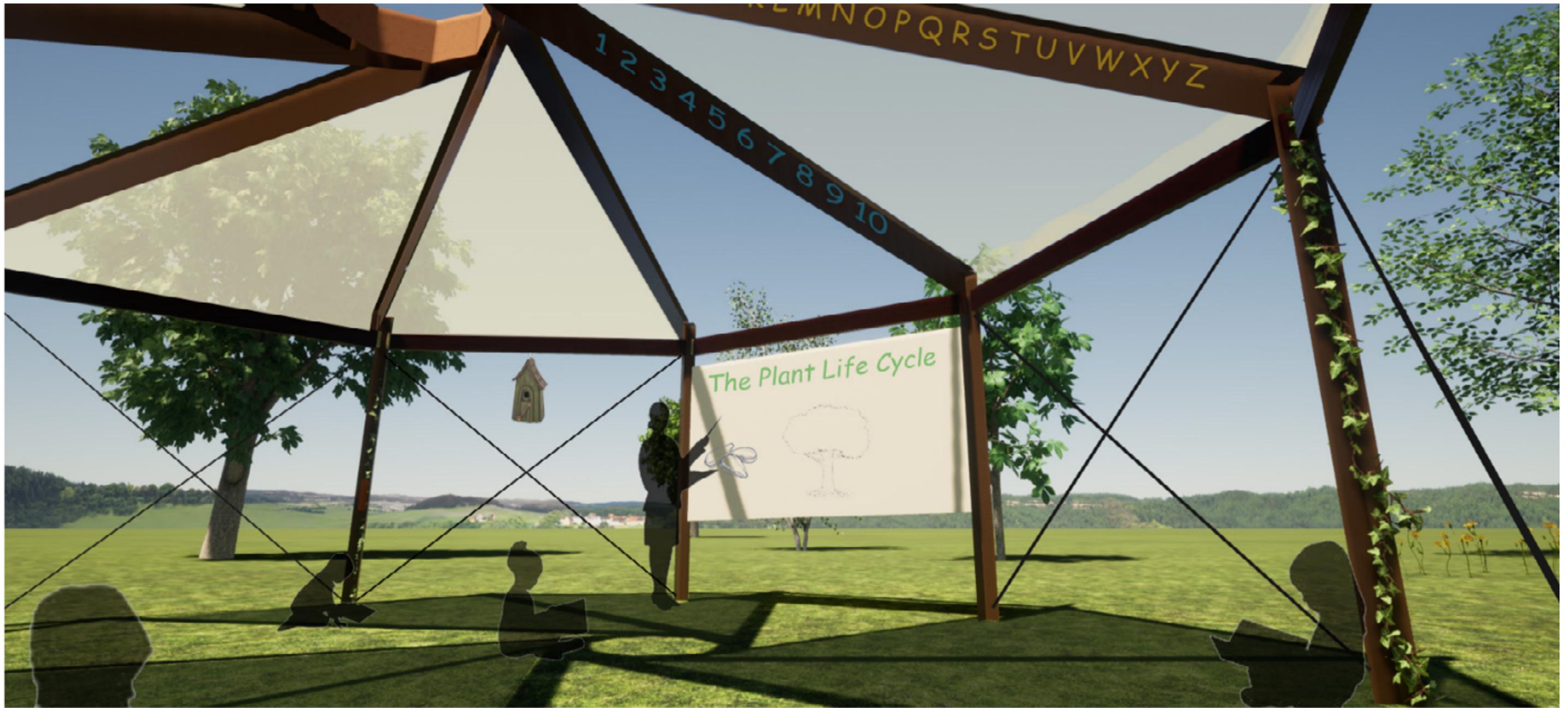
**DESIGNER: Sierra Johnson**  
**LOCATION: Lexington, Ky.**  
**TITLE: Cirque De Yurt**

**What the jury said:**

“Very strong illustration and instructional package. I love the self-tensioning aspect of the Yurt and how that also draws in the social distancing geometry. I see this as something that is achievable and fairly durable.”

“This design is just wonderful. It’s a great balance of bold and innovative but also practical both in the construction and the use of the space. It’s grounded in a specific tradition but allows for a high level of personalization so students can really feel like it reflects their own community.”

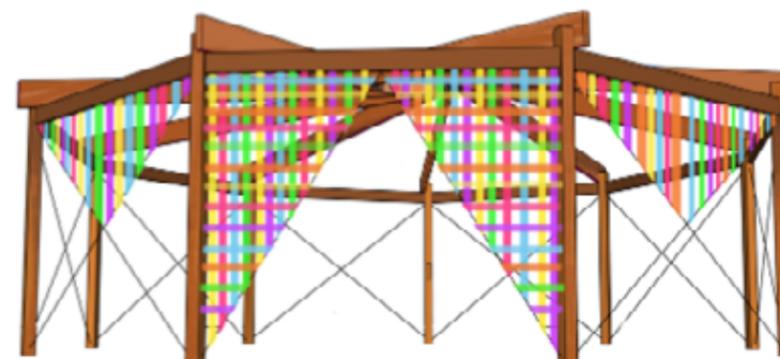




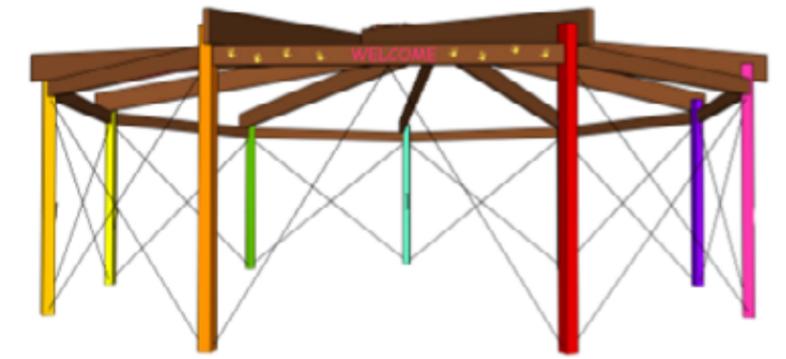
Interior View

# Make It Your Own

Cirque du yurt is a universal structure that can be transformed into any communities, schools, or organizations custom outdoor learning space. The idea is to let the users help design their space with whatever elements they see best whether that be colorful streamers, greenery, or custom art.

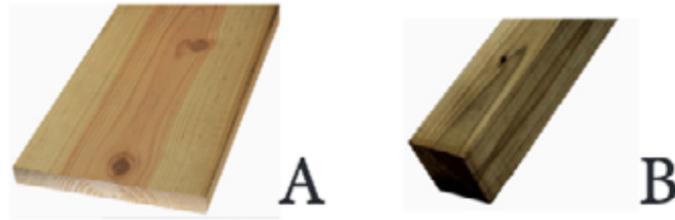


Optional Colorful Streamers



Optional Custom Art and Painting

## MATERIALS



A



B



C



D



E



F



G



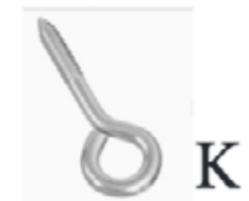
H



I



J



K



L



M



N



O



P



Q

## PROJECT COST BREAK DOWN

Materials	Individual Price	Quantity Needed	Total Cost
<b>Lumber</b>			
A 2x10x14-Southern Yellow Pine (Rafters)	\$22.55	9	\$202.95
B 4x4x8-Posts	\$14.27	9	\$128.42
C 2x6x10-Southern Yellow Pine (Horiz. Conn.)	\$14.74	9	\$132.66
D 2x10x10-Southern Yellow Pine (Oculus)	\$17.94	1	\$17.94
<b>Brackets/Connectors (Simpson Strong Ties)</b>			
E APDJT Deck Tie	\$5.78	18	\$104.04
F APLH Concealed-Flange Light Joist Hanger	\$4.68	18	\$84.24
G All Thread Rod	\$1.68	9	\$15.12
H All Thread Rod Washer	\$2.28	18	\$41.04
I 3/8" Nut	\$0.19	18	\$3.42
J Aircraft Cable	\$0.50 PER FOOT	198	\$99.00
K Eye Bolt	\$1.78	36	\$64.08
L Screws	\$27.98 PER BOX		\$27.98
M TuffBlock Post Base	\$103.90 (8-pack)	8	
	\$22.99 (individual)	1	\$126.89
		<b>Total Cost Materials</b>	<b>\$1,047.78</b>
<b>Optional Additons</b>			
N Phifertex® Plus Vinyl Mesh White 54" Fabric	\$19.90	32 YARDS (6 Sails)	\$636.80
O 3/4-in x 4-ft x 8-ft Southern Yellow Pine Plywood Sheathing (Student Desk)	\$46.29	6 Sheets	\$277.68
P 1/4-in x 4-ft x 4-ft Pine Sanded Plywood (Desk Book Shelves)	\$21.73	1 Sheet	\$21.73
Q 10-in Boston Fern in Plastic Hanging Basket	\$25.99	9	233.91



N



O



P



Q

## EQUIPMENT



POWER DRILL



MITER SAW

\*Materials "N" through "Q" are optional additional materials and can be substituted or omitted\*

**AWARD: HONORABLE MENTION,  
UNIVERSITY CATEGORY**

**DESIGNER: Bree Shoemaker**  
**LOCATION: Lexington, Ky.**  
**TITLE: Birds of a Feather**

**What the jury said:**

“Simple design. Achievable within the budget and I like the illustrations and directions. I also like some of the ‘additional details’ for how the class may adapt the space to their studies and cultural traditions.”

“Love the simplicity and open design, the easy-to-store desks and sitting mats, the “peg board” for teacher use and “string wall” for art. Like the emphasis on KY plants and inclusion of a garden. Benches for seating and storage are handy.” Even a YouTube installation tutorial!

**“OUTSCHOOLED” PROJECT- BERNHEIM ARBORETUM + RESEARCH FOREST**



**BREE SHOEMAKER**



**BIRDS OF A FEATHER**

## A LOOK INSIDE...

The open nature of this design allows for easy customization!

Bring school spirit to the classroom by decorating with school colors, and allow students to help weave the string wall together and proudly display their work.

Easily customize the "peg board" style wooden board wall with any addition the classroom may need! Add shelves for paper and book storage, hooks for backpacks, and bins to hold supplies.

Foldaway wooden desks are created with recycled wood and 4 simple hinges. The foldaway design allows students to work flat on the ground, or to fold the legs out for a higher work surface. Students are able to move their work space around and easily fold away to store!

Outdoor Sitting Mats from Snow Mountain Products allow students a comfortable, waterproof and lightweight option for sitting on the ground. Simply fold and store when not in use.

Storage benches are built from recycled wood with the option of sliding in crates for more storage. These are a great option for students who may be uncomfortable on the ground as well as adults (guardians, translators, etc) who may be accompanying a child.

Finally, allow students to be a part of the process by planting KY native plants that are not only attractive to birds and butterflies, but also will add a feeling of "enclosure" to the classroom without taking away from the open air design. See page 4 for plant and budget options!



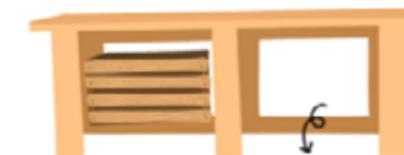
NO CHILD LEFT OUT!  
EXTREMELY OPEN +  
CUSTOMIZABLE FEATURES  
ALLOW FOR CHANGES TO  
BE EASILY MADE FOR  
CHILDREN OF ALL  
ABILITIES!



CUSTOMIZABLE  
"PEGBOARD" STYLE  
WALL



OUTDOOR SITTING MAT  
BY SNOWMOUNTAINPRODUCTS.COM

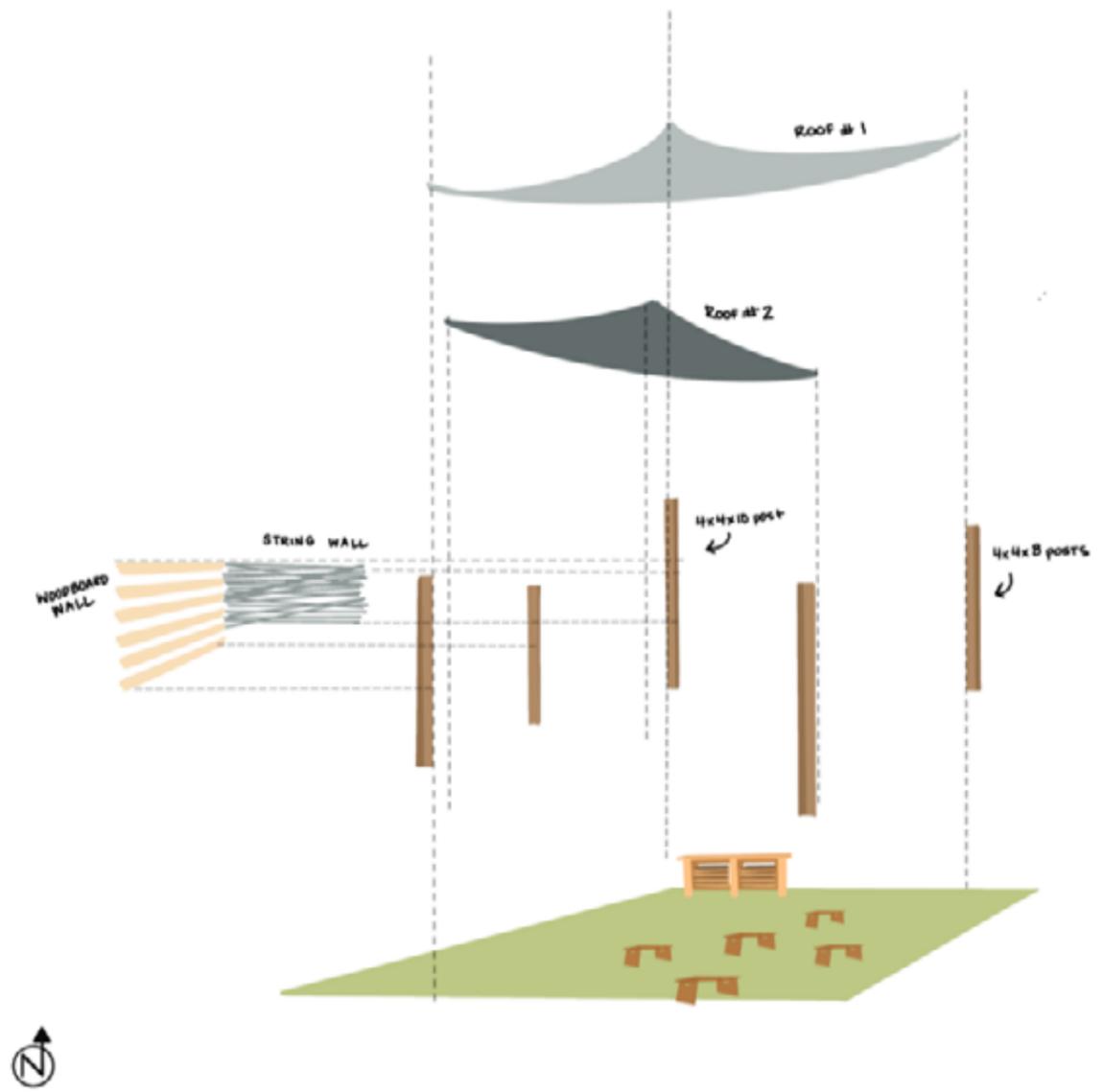


RECYCLED WOODEN GRATES  
PERFECT FOR STORAGE, OR  
ADD A LID  
FOR SEATING  
OPTION!

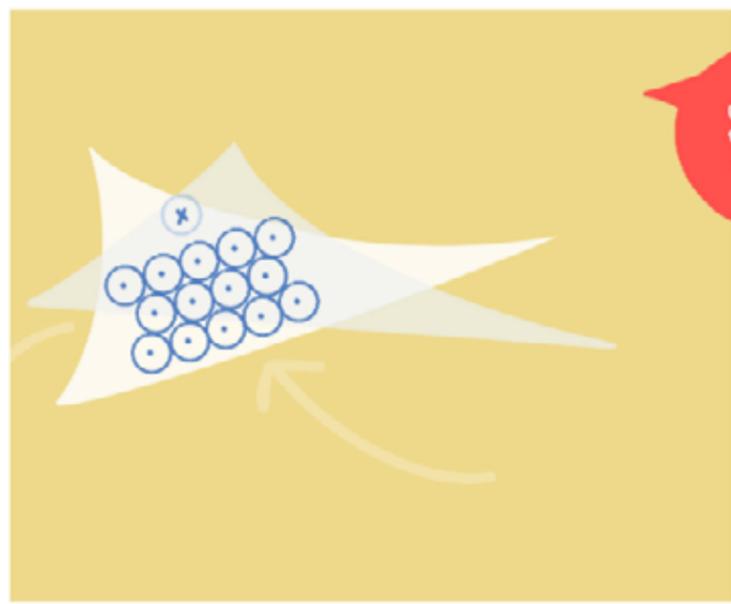
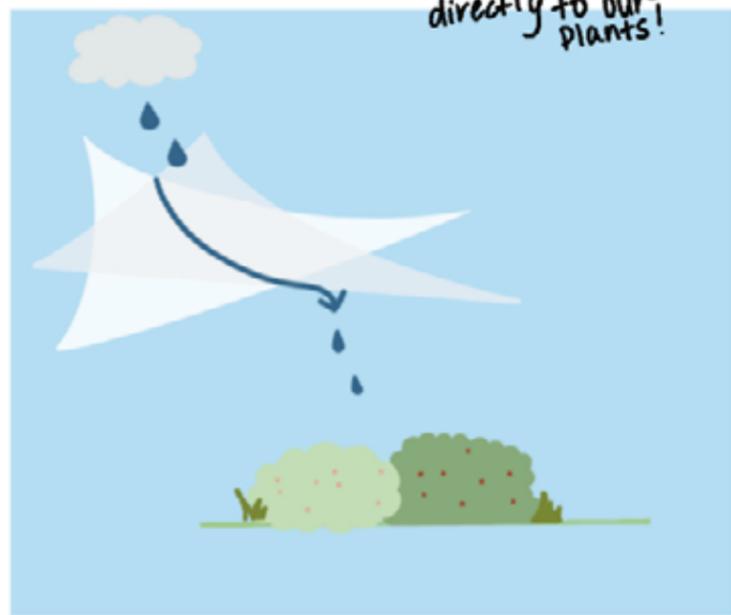
USE RECYCLED  
MATERIALS FOR  
THESE!



WOODEN  
FOLDAWAY  
LAP DESKS



Waterproof roof  
(installed at an angle)  
Keeps interior dry  
+ Run-off water goes  
directly to our  
plants!



STUDIES SHOW THAT  
OUTDOOR LEARNING IS  
BENEFICIAL FOR STUDENTS.  
INDEPENDENCE, CREATIVITY,  
INITIATIVE, CONFIDENCE  
AND MORE!

COVID safe seating for 13(+) students.  
Easy to expand or spread out -  
No walls for greater and natural  
air circulation.  
(MULTIPLE ENTRY/EXIT POINTS)

# MATERIALS NEEDED & PROJECTED COST

SUN SHADE ROOF	SAIL 1	SAIL 2	PROJECTED COST (FOR BOTH SAILS)
 Stearmoid Top 12.64 Oz. Pearl Grey 59" Vinyl Fabric \$31.95/YD*	32.22 yards	Sail 2 - 19.03 yards	\$1638
 2 inch Polyester Webbing \$8.85/FT*	96.6 feet	84.77 feet	\$155
 Seamstick Basting Tape for Canvas \$10.45/ea*	7	4	\$115
 Round Stainless Steel Ring 2" \$4.95/ea*	3	3	\$30
 5/16 in. x 1 ft. Grade 30 Galvanized Steel Proof Coil Chain \$2.85/ft	approx 3-6 ft	approx 3-6 ft	\$34
 Eye Bolts \$0.82/ea	3	3	\$5
 5/16 in. Stainless Steel Quick Link \$7.95/ea	3-6	3-6	\$96
 1/4 in. x 5-1/4 in. Stainless Steel Hook and Eye Turnbuckle \$5.87/ea	2	2	\$24
 V-92 White UV Bonded Polyester Thread 4 oz. (1,350 yds.) \$14.95/ea*			\$15

\* indicates priced from sailrite.com  
(all other items priced from Home Depot unless otherwise stated)

EXAMPLES OF NATIVE KY BIRD/BUTTERFLY ATTRACTING PLANTS

**SPRING**




TRUMPET HONEYSUCKLE      DUTCHMAN'S PIPEVINE

**SUMMER**




PURPLE CONEFLOWER      TROPICAL MILKWEED

**FALL**




MIST FLOWER      NEW ENGLAND ASTER

**ALLOW \$500 FOR PLANTS**

**POSTS**



4in x 4in x 10 ft  
Pressure-Treated Timber  
(x1) \$21.98 ea



4in x 4in x 8 ft  
Pressure-Treated Timber  
(x4) \$14.88 ea

**"WALLS"**



1 in. x 6 in. x 12 ft.  
Pressure-Treated Board  
(x6) \$10.27 ea



1/4 in diameter  
Polyester Rope  
600 ft- \$54



Outdoor Sitting Mat  
\$9.95/ea  
@ SnowMountainProducts.com



Storage Bench  
Reclaimed wood  
Wooden crates  
est. cost per bench \$60



Foldable Desk  
Reclaimed wood  
4 hinges

## INSTRUCTIONS FOR ASSEMBLY



Follow this link for a shade sail installation tutorial!  
[https://youtu.be/\\_HEWxsydOss](https://youtu.be/_HEWxsydOss)

# TOTAL PROJECTED COST \$3000

including structure, sitting mats, and one storage bench

DESIGNER: **Brian Lightner**  
 LOCATION: **Lexington, Ky.**  
 TITLE: **Helio Hut**

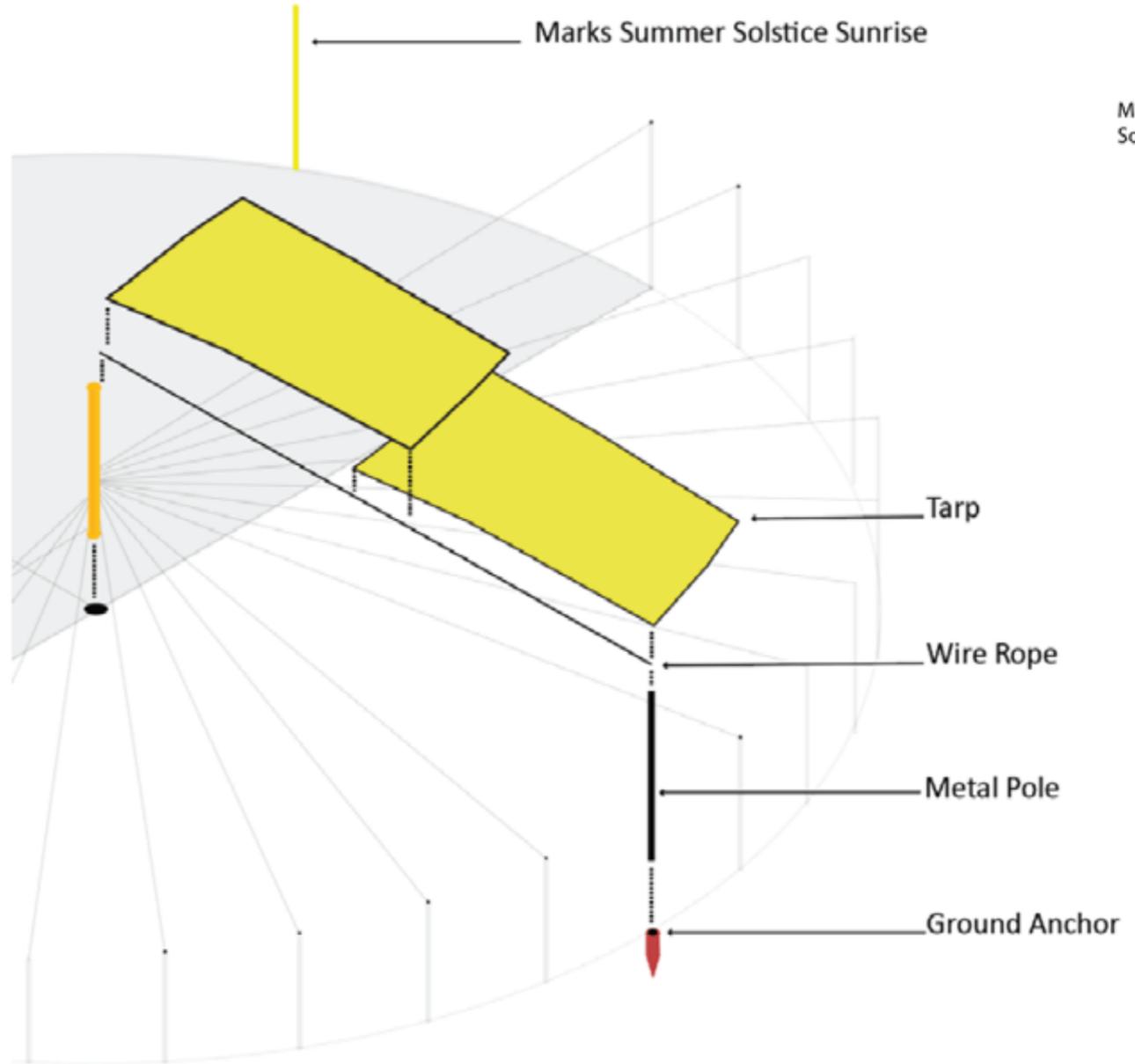
#### What the jury said:

“The illustration is well done and I like the circular footprint. I’m also impressed with the attention to how this structure sits within the geometry of solar events.”

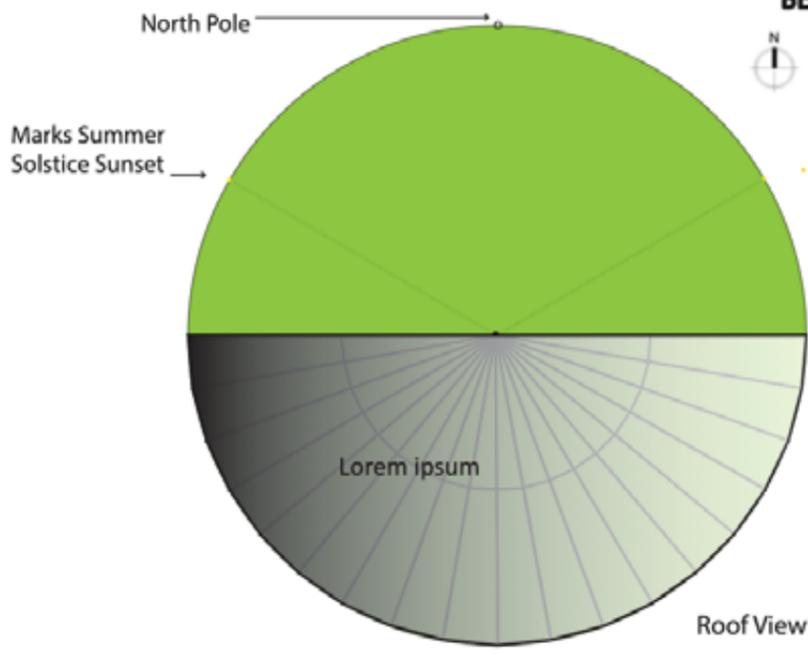
“This is a beautiful concept and I love how responsive it is to the environment and the seasons. The construction is practical and easy to understand.”



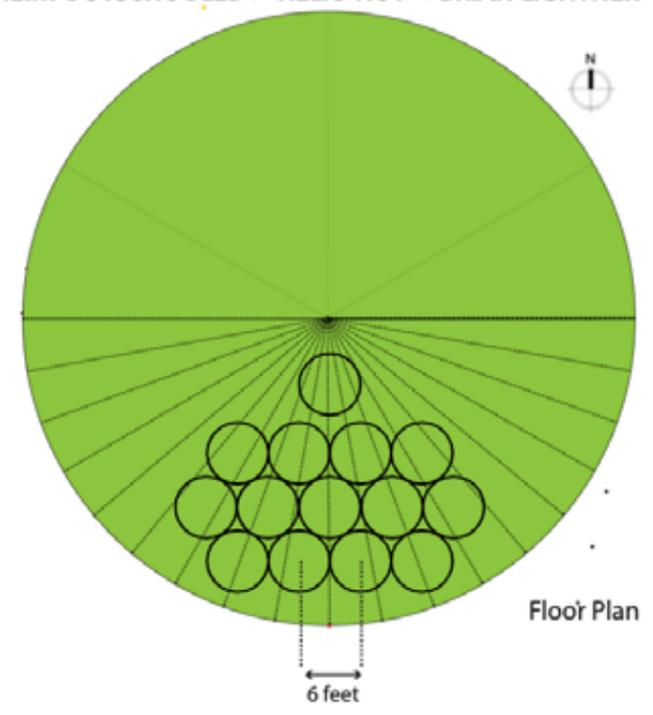
Helio Hut is an innovative, indigenous-inspired outdoor classroom that provides a healthy space for students to continue their education in-person. With ample air flow, ambient light and socially distanced seating for 13 students and a teacher, this sturdy water-proof structure will provide a safe, healthy space for students to connect with their peers, with academic content, and most importantly, nature. Inspired by Indigenous culture's reverence for their environment, Helio Hut was designed with the intention to instill our youth with a love of the natural world in hopes that they will one day carry the torch of stewardship. On a basic level, the circular footprint of Helio Hut reflects the shape of our Sun (Moon, and Earth), yet on a deeper level symbolizes the many cycles that define our existence. From classroom to compass, from clock to cycles and seasons of life, Helio Hut connects the youth of today with the wisdom of our ancestors for a healthier future for all.



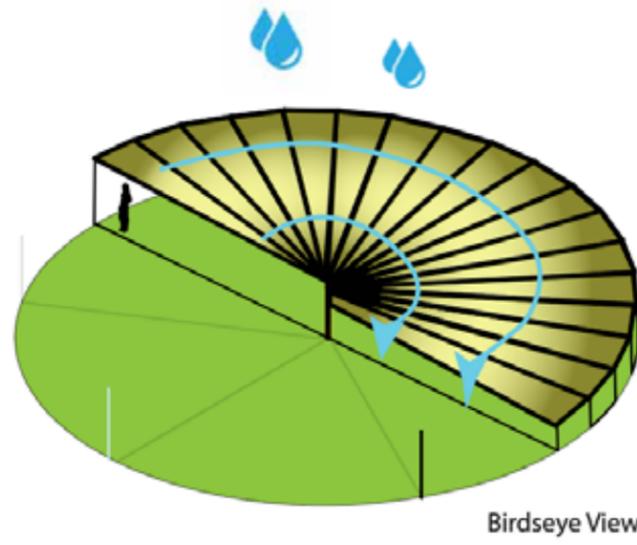
Exploded Axometric



Roof View

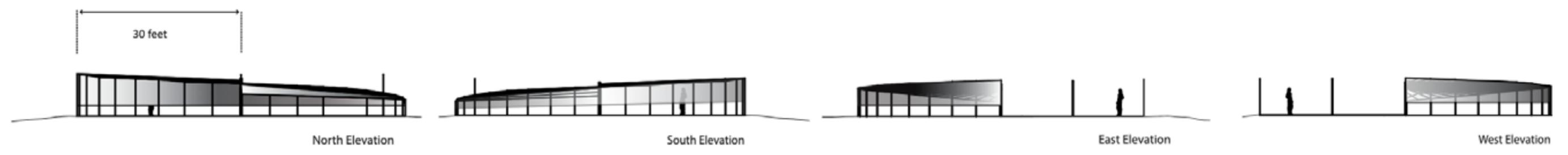


Floor Plan



Birdseye View

Designed to serve as these Instructional Tools:



North Elevation

South Elevation

East Elevation

West Elevation



	Material	Cost	Quantity	Subtotal
A	Bucket, 5 gallon	\$3.78	13	\$49.14
B	Freestanding Chalkboard	\$185.99	1	\$185.99
C	Galvanized Aircraft Cable 1/8" x 50'	\$17.98	3	\$53.94
	Galvanized Aircraft Cable 1/8" x 500'	\$125.99	1	\$125.99
D	Galvanized Steel Pipe 2" x 10'	\$56.13	6	\$336.78
	Galvanized Steel Pipe 2" x 5'	\$38.60	1	\$38.60
	Galvanized Steel Pipe 2" x 5'6"	\$46.32	1	\$46.32
	Galvanized Steel Pipe 2" x 6'	\$46.32	1	\$46.32
	Galvanized Steel Pipe 2" x 6'6"	\$54.04	1	\$54.04
	Galvanized Steel Pipe 2" x 7'	\$54.04	1	\$54.04
	Galvanized Steel Pipe 2" x 7'6"	\$61.76	2	\$123.52
	Galvanized Steel Pipe 2" x 8'	\$32.95	3	\$98.85
	Galvanized Steel Pipe 2" x 8'6"	\$69.48	2	\$138.96
	Galvanized Steel Pipe 2" x 9'	\$69.48	2	\$138.96
	Galvanized Steel Pipe 2" x 9'6"	\$77.20	2	\$154.40
D	Galvanized Steel Pipe 6" x 14'	\$32.52	14	\$455.28
E	Ground Screw	\$32.99	22	\$725.78
F	Igloo 110qt Glide Pro Wheeled Cooler	\$119.99	2	\$239.98
G	Padded Bucket Lid	\$12.95	13	\$168.35
H	Pipe Clamp 2" (20 pack)	\$20.99	1	\$20.99
I	Pipe Clamp 6"	\$14.95	19	\$284.05
J	Rope Thimbles 2-pack	\$1.50	20	\$30.00
K	Stainless Steel Spring Link 3/8" x 3 1/2"	\$8.98	38	\$341.24
L	Table Mate II Folding Adjustable TV Tray Table	\$39.99	14	\$559.86
M	Tarp Clips 15-pack	\$15.99	6	\$95.94
N	Tarp, Yellow 10'x16'	\$49.68	1	\$49.68
	Tarp, Yellow 20'x30'	\$109.03	6	\$654.18
O	Turnbuckles 3/8" x 10-1/2"	\$3.66	20	\$73.20
P	Wire Rope Clamps 1/8"	\$1.27	76	\$96.52
			<b>Total:</b>	<b>\$5,440.90</b>

**Directions:**

- Starting due East, 30 feet from a central stake, hand-screw 1 ground screw every 5' 1 1/2" on center, radially, 30 feet from center using string as a guide, moving Southward and ending due West (19 ground screws total).
- From due West, hand-screw 1 ground screw 15' 5" Northward radially, 30 feet from center; this will be the marker for the sunset on the summer solstice.
- Continuing Northward, hand-screw 1 ground screw 29' 9 3/4" on center, 30 feet from the central pole aligned with the center post and the Southmost ground screw; this is the North pole.
- Insert 1 ground screw 29' 9 3/4" on center from the North pole moving East, 30 feet from the central pole; this will be the marker for the sunrise on the summer solstice.
- With a 6" wide hand auger, dig out 4 feet of dirt on center at the central post and insert the 14' steel pipe.
- Starting from the Westernmost ground screw, insert and secure the 5' steel pipe. Continue Southward securing the next longest pipe into their respective screws, ending with a 10' pipe at the Northwest summer solstice screw.
- Attach at 2" pipe clamp 2" below the top of each pipe with a stainless steel spring link.
- Attach one end of a 28' 1/4" of wire rope to each of the 19 stainless steel spring links, and the other end to a turnbuckle.
- Attach a 6" pipe clamp 4 1/2" below the top of the Central Pipe facing due East. With a stainless steel spring link, connect the other end of the Easternmost wire rope/turnbuckle combination to the Central Pipe.
- Continue step 9 about every 2" below the previous clamp.
- Tension the wire ropes.
- Starting in the West, layer and clip into place the 20' x 30' tarps overlapping from outer circle to inner circle, with the 10' x 16' tarp covering the Central Pipe area.
- Assemble the chalkboard; Snap padded lids onto buckets; Assemble TV Trays; and place coolers for on-site storage.



DESIGNER: **Will Roberts**  
 LOCATION: **Lexington, Ky.**  
 TITLE: **Authentic Bernheim  
 Cardboard (ABCs)**

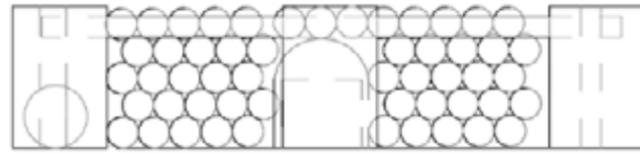
**What the jury said:**

“I applaud the use of a recycled and recyclable material that is ready at hand and I think the design is clean and appropriate for a school purpose.”

“I love Shigeru Ban’s work and have to assume that cardboard tubes could be a sturdy material. I was skeptical at first, but having handled the cardboard tubes that go in massive carpet rolls, I see them being possible.”



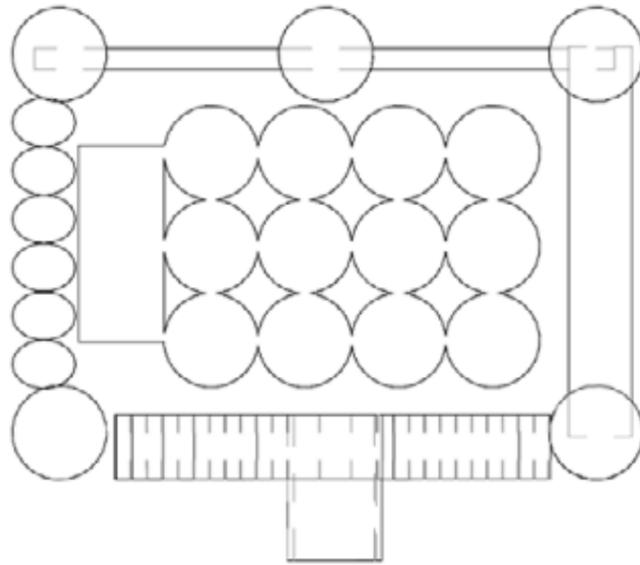
Front



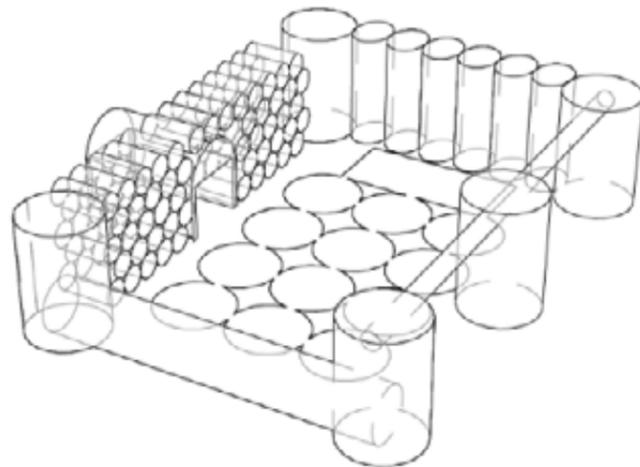
Right



Top



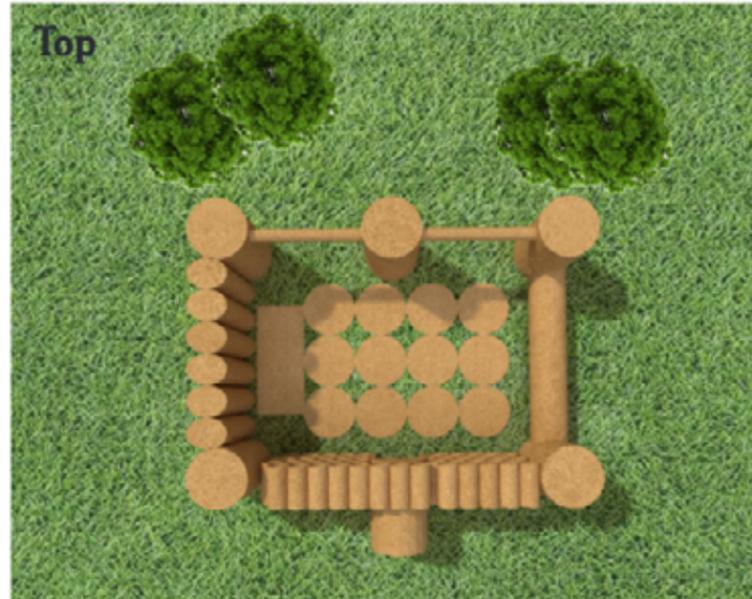
Perspective



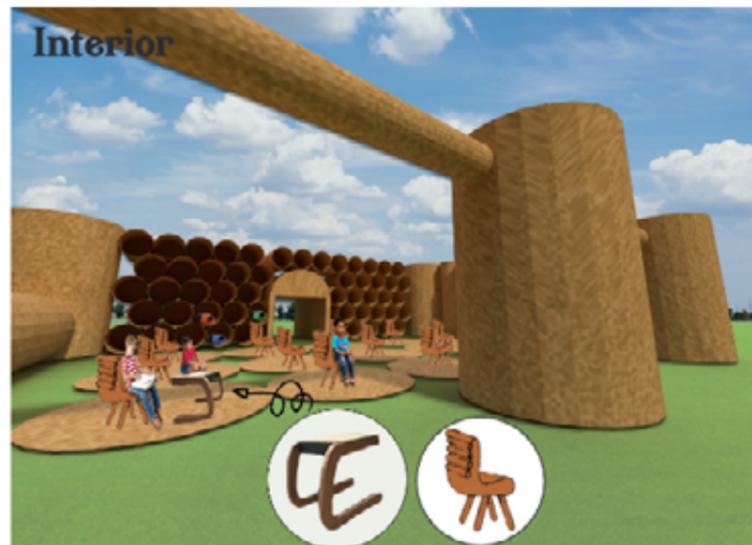
Back



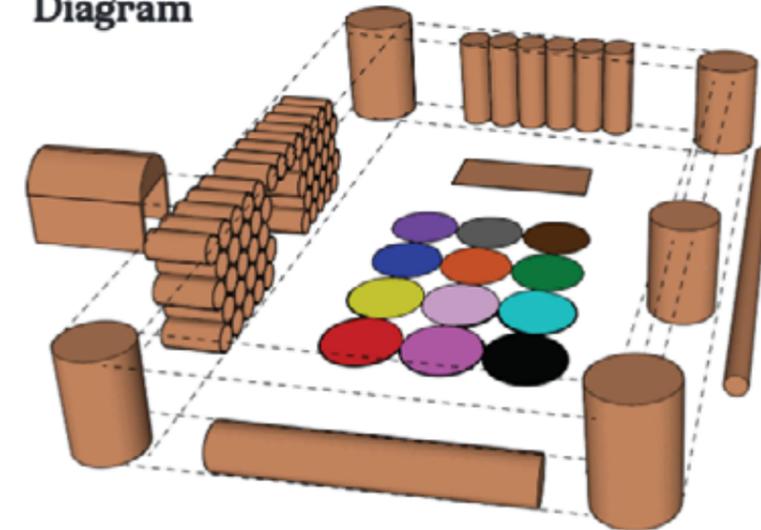
Top



Interior



Diagram



The back three large **cardboard tubes** would be connected by two 18 ft. thinner cardboard tubes or one 36 ft. thinner cardboard tube. For extra support, the **Galvanized Cable Reel** can be used by connecting the tubes.

The Galvanized Cable Reel can also be used to help secure the roofing, which would consist of a 30 ft. long tube being placed horizontally across the middle, right on top of the back middle tube to the front shorter tubes to make the **Heavy Duty Silver/Black Poly Tarp 50'x50'** form a slope for rain and inclement weather. The rings on the Heavy Duty Silver/Black Tarp would be secured down by the galvanized cable reel at each corner.

The **cardboards treatment** consists with Polyurethane which is eco-friendlier than other treatments and very reliable because of its longevity and energy efficiency, both of which have positive impacts on the environment and the effects of climate change.

The **flat cardboard circles** which are used as guidelines for social distance, as well as, for aesthetics, are able to be painted by kids/community.

The **seating** and **desk** are both made completely from cardboard. The chair legs are able to be moved for floor sitting, and the legs can be secured on the back of the chair.

The **Wall of Cubbies** will be secured using nuts and bolts, three fasteners will connect each side there is a tube. The wall of cubbies will be used to store items such as backpacks, supplies, snacks, and more. The back tube that connects the left side can also be used as storage.

The **entrance** will be made from 2x4x8s wood planks as frames, the ceiling will be barrel vaulted to form the arch, and covered with cardboard.

# Inspiration

Inspired greatly by Shigeru Ban, a Japanese architect, known for his innovative work with paper, particularly recycled cardboard tubes being used to create structures. Cardboard is a great material because of its environmentally low-impact, it's virtually a waste product; it's easy to manufacture; it has good insulating properties, an attractive texture, and it's cheap.

Depending on the purpose of the structure, perhaps the most objectionable aspect of cardboard architecture is its temporary aspect. Ban's Christchurch cathedral is designed to last 20 to 30 years, which could be long enough for most people and not long enough for others but like Shigeru Ban said, I quote, "a building's lifetime doesn't depend on what it's made from, but how much it's loved. If a building is valued, it's looked after, restored, repaired, rebuilt."

**Shigeru Ban - Paper Log House**



**Shigeru Ban - Paper Log House**

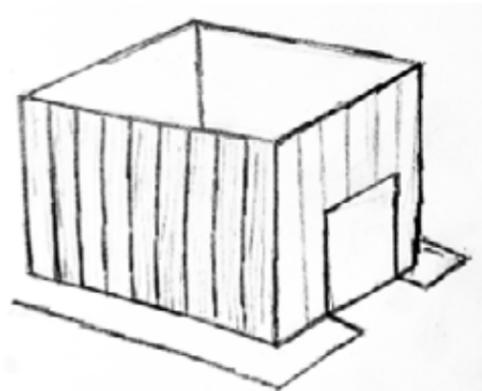
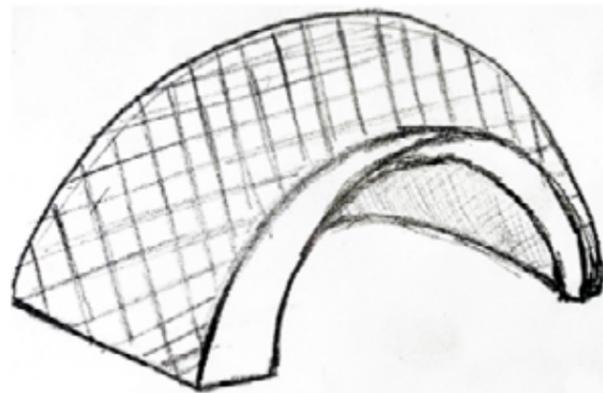
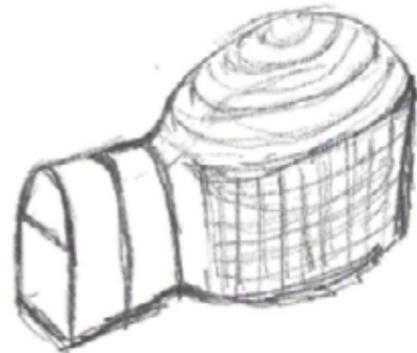
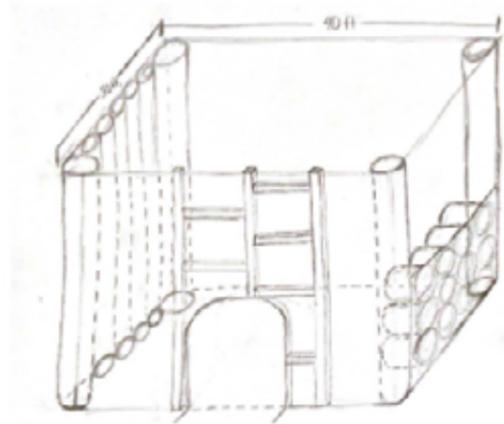


**Shigeru Ban - Cardboard Cathedral**

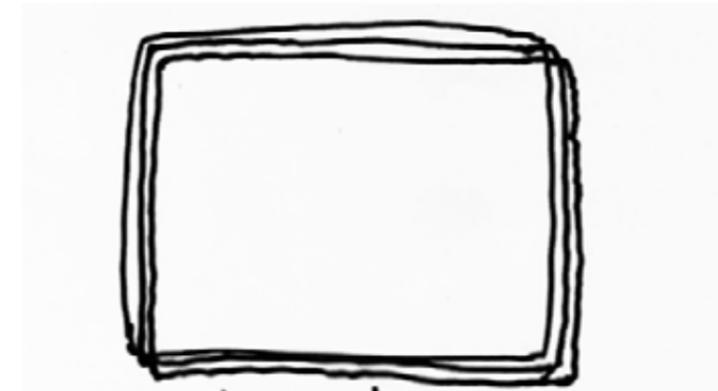
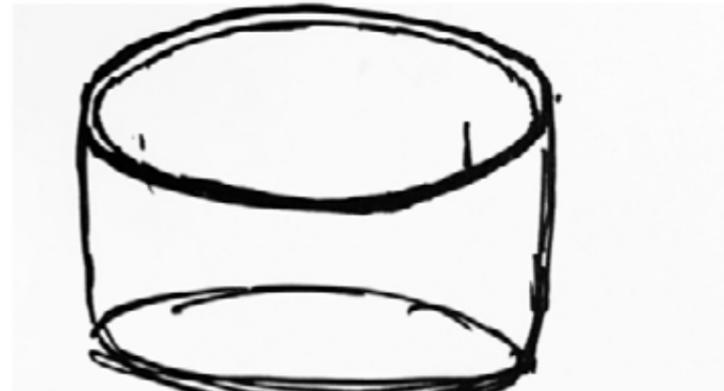
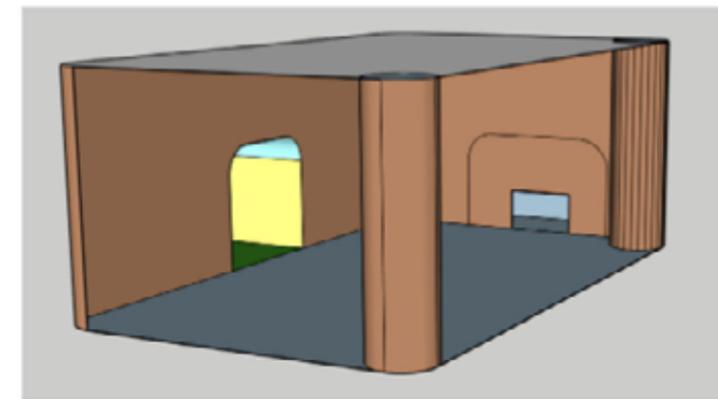
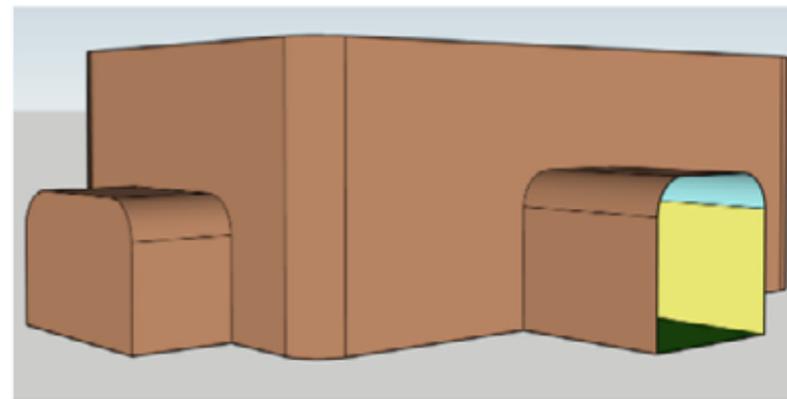
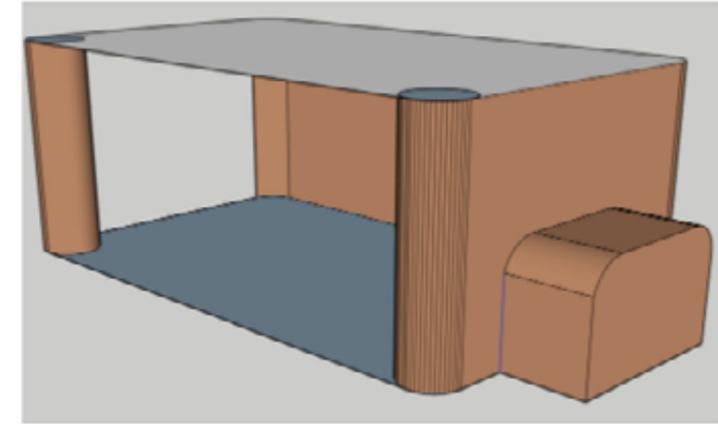
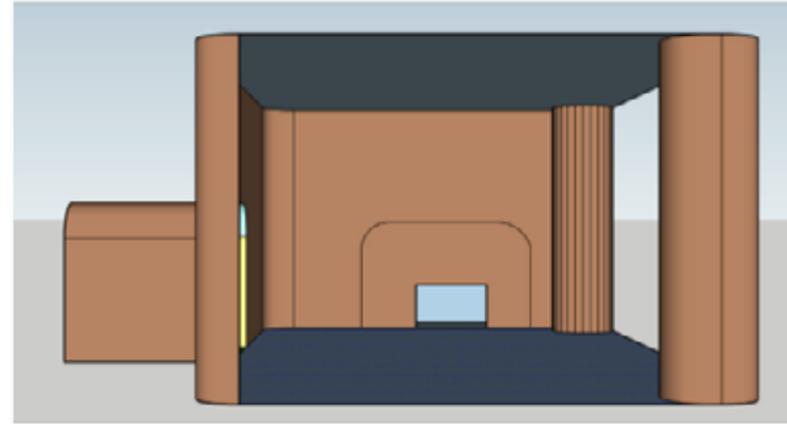


**Shigeru Ban - Abu Dhabi Art Pavilion**

# Sketches



# Roughs



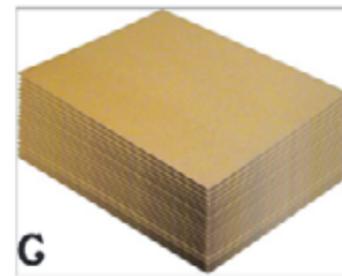
# Materials



A



B



C



D



E



F



G



H



I



J



K



L



M



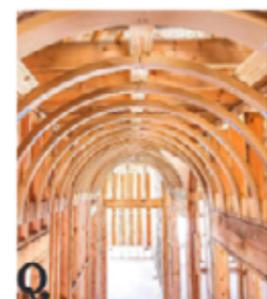
N



O



P



Q

<b>A. &amp; C.</b> Prices vary but can also be donated and found.	
<b>B.</b> 2 in. x 4 in. x 8 ft. #2 Ground Contact Pressure-Treated Lumber (\$8.47) x20	<b>\$169.40</b>
<b>D.</b> #14 x 3" Self Tapping Sheet Metal Screws Hex Head Stainless Steel Qty 25 (\$16.05) x13	<b>\$208.65</b>
<b>E.</b> Everbilt 3/8 in. Stainless Steel Lock Washer (25-Pack) (\$4.20) x13	<b>\$54.60</b>
<b>F.</b> 2 in. Flat Chip Brush Set (15-Pack) (\$10.48)	<b>\$10.48</b>
<b>G.</b> #6 x 2 in. Philips Bugle-Head Coarse Thread Sharp Point Drywall Screws (1 lb./Pack) (\$5.97) x5	<b>\$29.85</b>
<b>H.</b> 4 in. Flat Chip Brush (\$4.22) x15*	<b>\$63.30</b>
<b>I.</b> Everbilt 3/8 in.-16 Zinc Plated Hex Nut (100-Pack) (\$13.50/box) x4	<b>\$54.00</b>
<b>J.</b> 9 in. 5-Wire Heavy-Duty Roller Frame (\$4.18) x15*	<b>\$62.70</b>
<b>K.</b> Fiberglass Resin Polyester Resin Marine Grade Resin 10 Gallon with MEKP Hardener Polymer Resin Polyester Fiberglass Resin Fiberglass Repair Kit (\$42.50/item)	<b>\$424.87</b>
<b>L.</b> Home Depot Varathane Clear Satin Oil-Based Interior Polyurethane 2-Pack 1 gal. each (\$69.96/case*) x4	<b>\$279.84</b>
<b>M.</b> 9 in. x 3/8 in. High-Density Polyester Knit Paint Roller Cover (3-Pack) (\$9.29)	<b>\$9.29</b>
<b>N.</b> Amazon PVA Adhesive Coating Pack of 2 (8 oz) (\$17.99)	<b>\$17.99</b>
<b>O.</b> Heavy Duty Silver/Black Poly Tarp 50'x50' (\$199.98)	<b>\$199.98</b>
<b>P.</b> 3/16" X 500', 7x19, Galvanized Cable Reel (\$102.39)	<b>\$102.39</b>
<b>Q.</b> Archwaysandcelings.com Barrel Vaults 96x48in (\$192.33)	<b>\$192.33</b>

**Total \$1924.21**

\*Number of participants may vary, but the number 15 is incase everyone needs their own brush plus an extra. Also, see manufacturers safety requirements. All waterproof coating has its own set of instruction, which is worth noting before treating the cardboard.



# I ZIG, U ZAG

BERNHEIM'S OUTSCHOOLED: DESIGN TO REVOLUTIONIZE OUTDOOR LEARNING

PARKER SELIN

DESIGNER: **Parker Selin**  
 LOCATION: **Lexington, Ky.**  
 TITLE: **I ZIG, U ZAG**

## What the jury said:

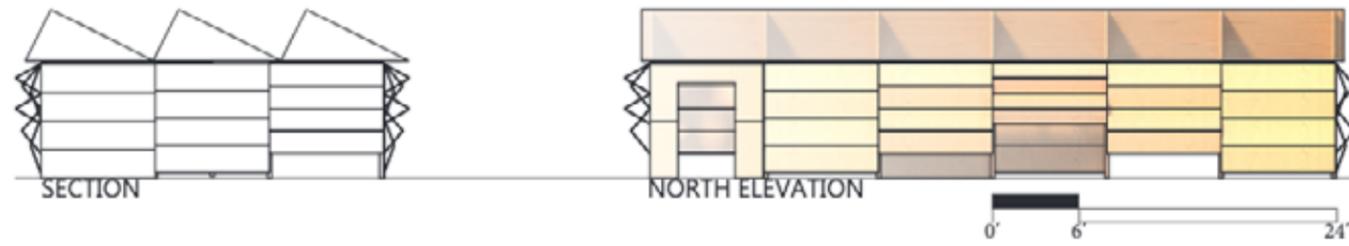
"This is such a striking design and with color it really looks amazing. I love the furniture, too."

"I like the organization around air flow and shutters – especially as a Covid response."

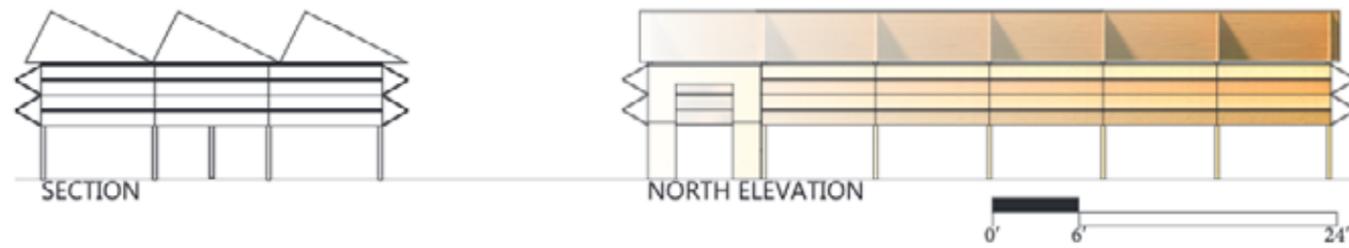
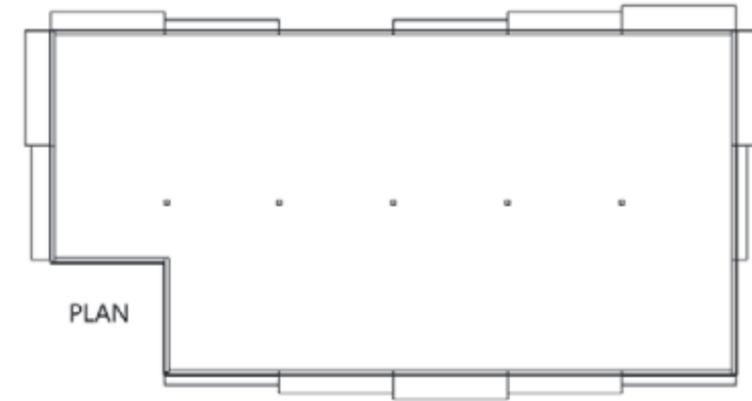


I ZIG, U ZAG IS A HIGHLY CUSTOMIZABLE CLASSROOM DUE TO ITS SHUTTER SYSTEM. THIS SYSTEM ALLOWS FOR STUDENTS TO ENJOY THE OPEN AIR AS MUCH AS POSSIBLE. IF THERE IS A STRONG BREEZE ONE DAY, SHUTTERS CAN BE CLOSED ON ONE SIDE WHILE STAYING OPEN ON ANOTHER TO MAINTAIN PROPER VENTILATION. DESKS THAT ARE 6' APART AND THE SHUTTER SYSTEM ARE NEEDED DUE TO THE COVID-19 PANDEMIC TO KEEP THE SPACE SAFE FOR ALL LEARNERS AND TEACHERS.

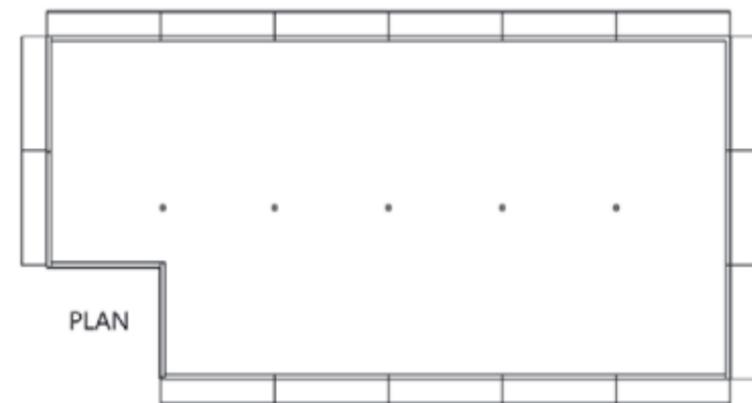
# VARIOUS COMBINATIONS OF SHUTTER SETTINGS



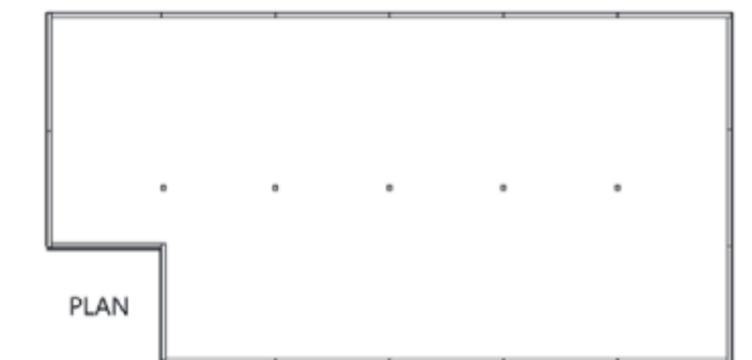
SHUTTERS MIXED



SHUTTERS UP



SHUTTERS DOWN



# BUILDING GUIDE

I



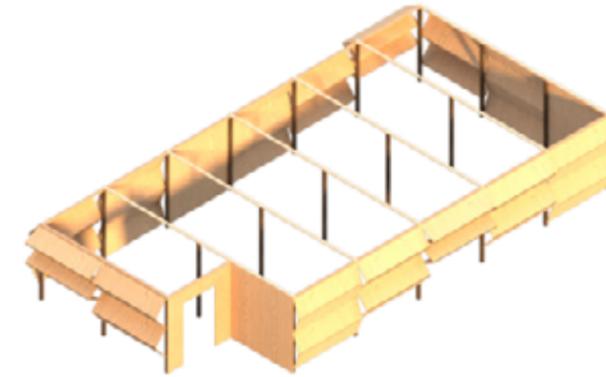
ARRANGE 4"x4"x8' STUDS

II



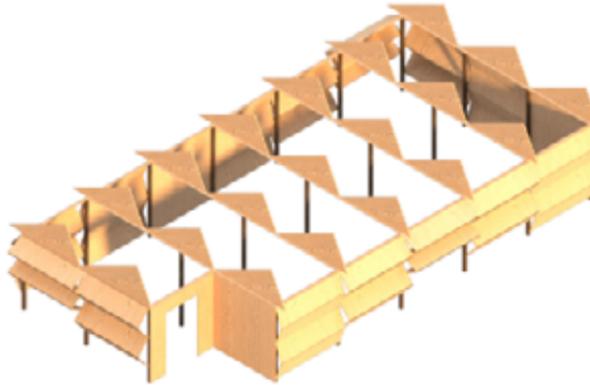
INSTALL 2"x4"x12 AND 2"x4"x10' STUDS FOR CROSS SUPPORT

III



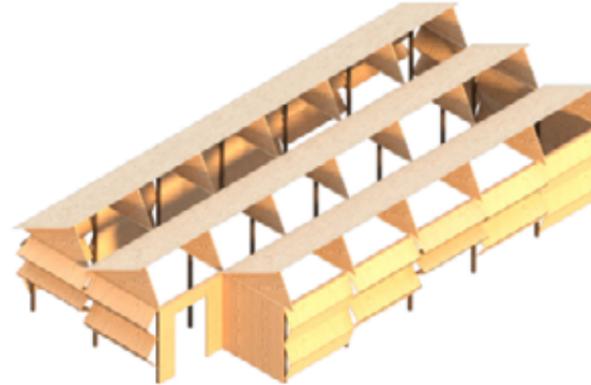
INSTALL PRE-ASSEMBLED SHUTTERS WITH 3 HINGES ATOP THE 12' STUDS

IV



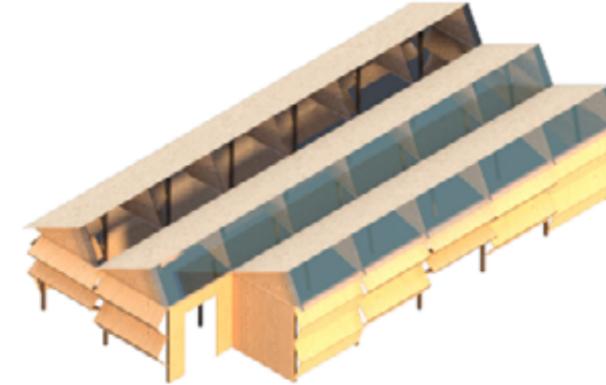
ATTACH TRUSSES TO THE CROSS SUPPORT STUDS

V

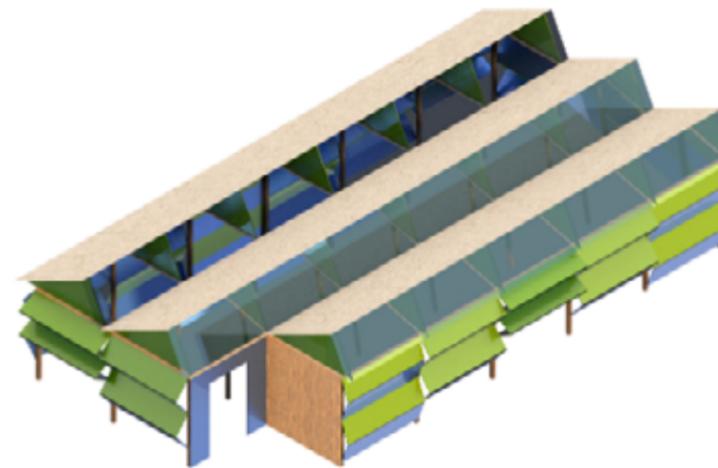


INSTALL ROOF MADE OF RECLAIMED TIN ROOFING

VI

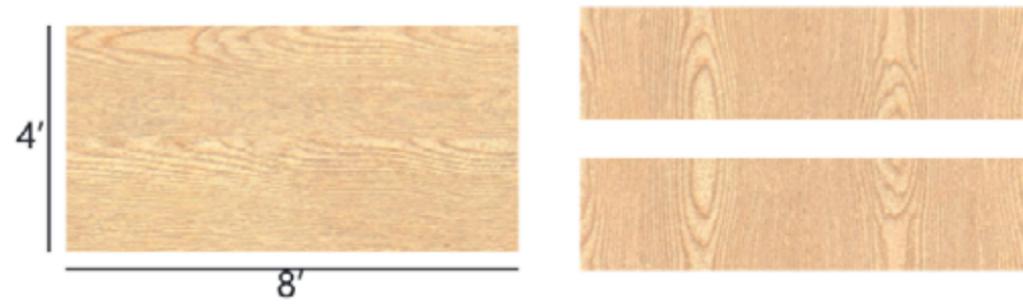


INSTALL PLEXI GLASS WINDOWS TO ALLOW NATURAL LIGHT INTO THE CLASSROOM

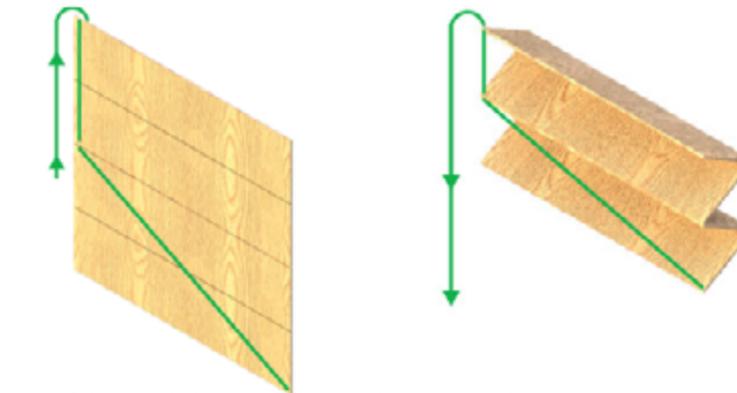


PAINT THE SHUTTERS TO MAKE YOUR CLASSROOM UNIQUE!

# COMPONENT AND CUT INSTRUCTIONS



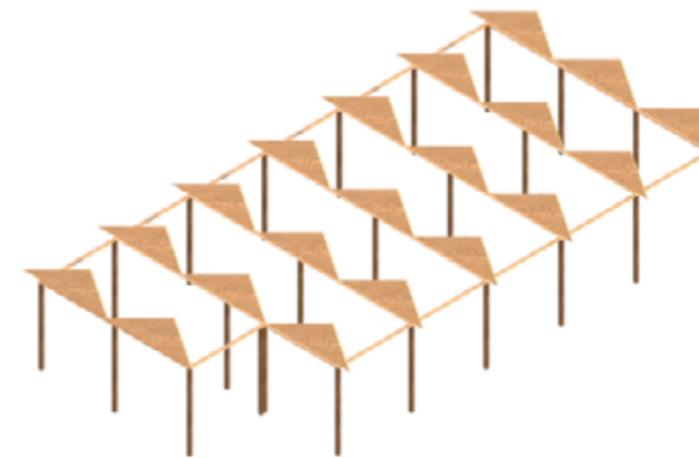
CUT BISECTING THE 4'x8' PLYWOOD SHEET RESULTING IN TWO 2'x8' COMPONENTS



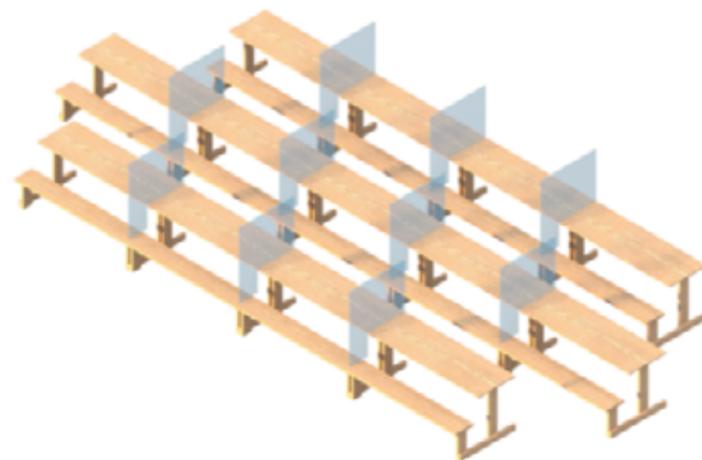
SHUTTER SYSTEM OPERATION WHERE ROPE IS TIED OFF TO A CLEAT ATTACHED TO EACH POST



CUT DIAGONALLY ACROSS THE 4'x8' PLYWOOD SHEET TO FORM TWO TRUSSES



INSTALLED TRUSSES



DESKS WITH PLEXIGLASS DIVIDERS EVERY 6' TO ACCOMMODATE 13 STUDENTS



CUBBIES FOR ALL STUDENTS AS WELL AS ADDITIONAL STORAGE BEHIND TEACHER'S DESK

DESIGNER: **Dalton Shewcraft**  
 LOCATION: **Lexington, Ky.**  
 TITLE: **The Hammock**

**What the jury said:**

“The flexibility, scalability and “kit of parts” aspect of this design are very nice. I think better anchoring strategies for the tarp supports may be called for. This is certainly a low cost entry for schools to contemplate. I can see this design as a door opener for more outdoor class gathering.”

“I’m impressed by this design’s simplicity and its generous size. The colors really make a simple design fun and vibrant. The construction drawings and instructions make it very viable to realize.”

BERNHEIM OUTSCHOOLED | “THE HAMMOCK” | DALTON SHEWCRAFT

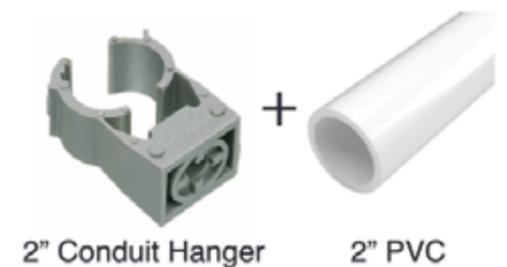


**The Hammock**

“The Hammock” is an innovative solution aimed at creating a healthy outdoor space that is safe for children to learn and grow in. Recent studies show that outdoor learning can lead to better childhood development, academic performance, and health. In light of the recent pandemic, health of our children is at the top of the priority list.

The Hammock provides enough space for 18 students and one teacher to be comfortably spaced 6 feet apart while providing them with sturdy overhead cover and plenty of natural ventilation. The advantage to this classroom proposal lies in its adaptable design. The combination of the two items to the right create a “snap-on” system that creates endless possibilities.

**The Hammock Snap-On System**

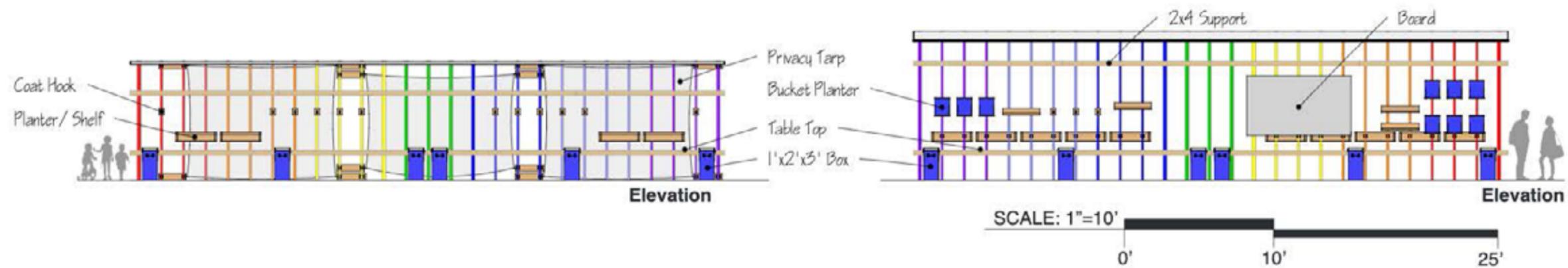
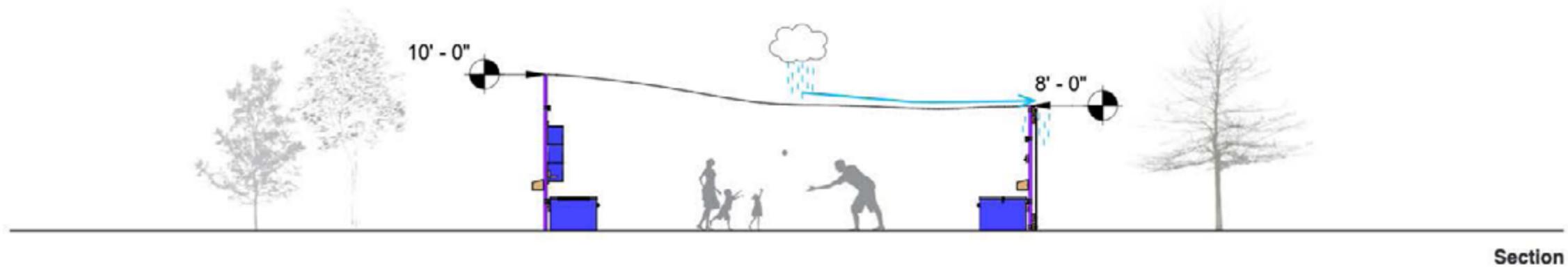
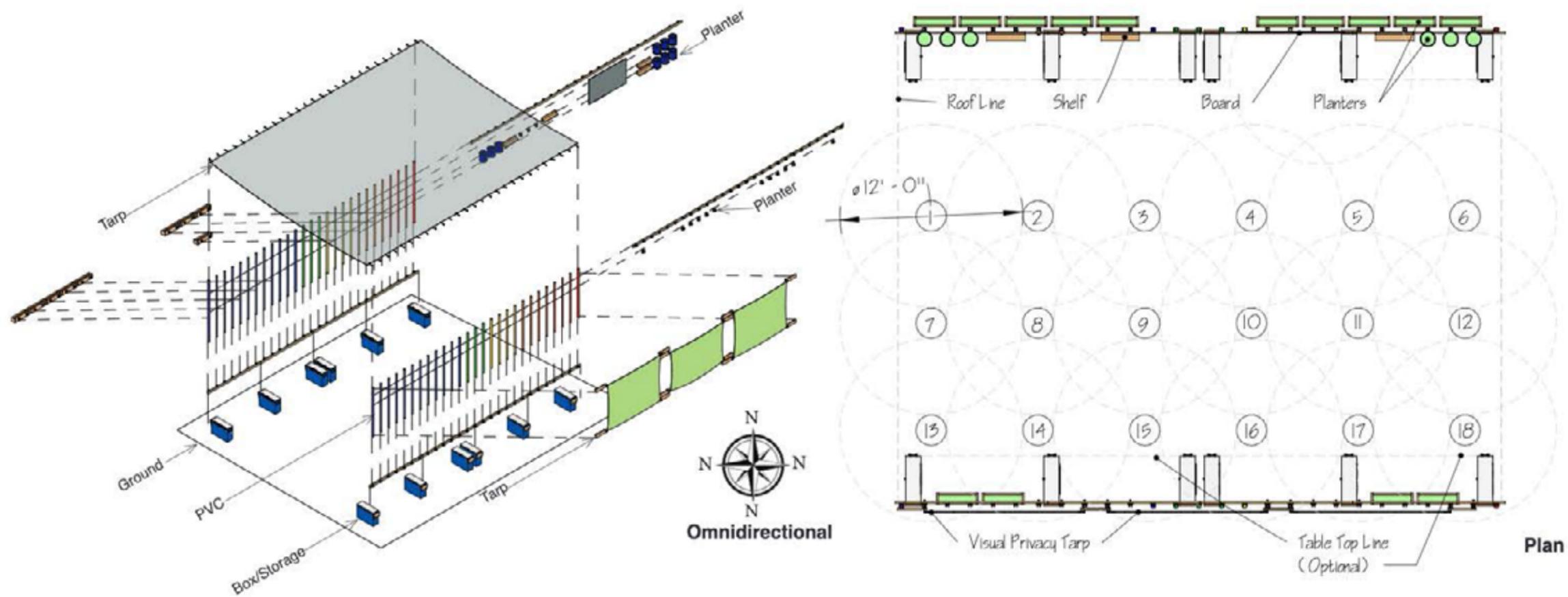


2" Conduit Hanger

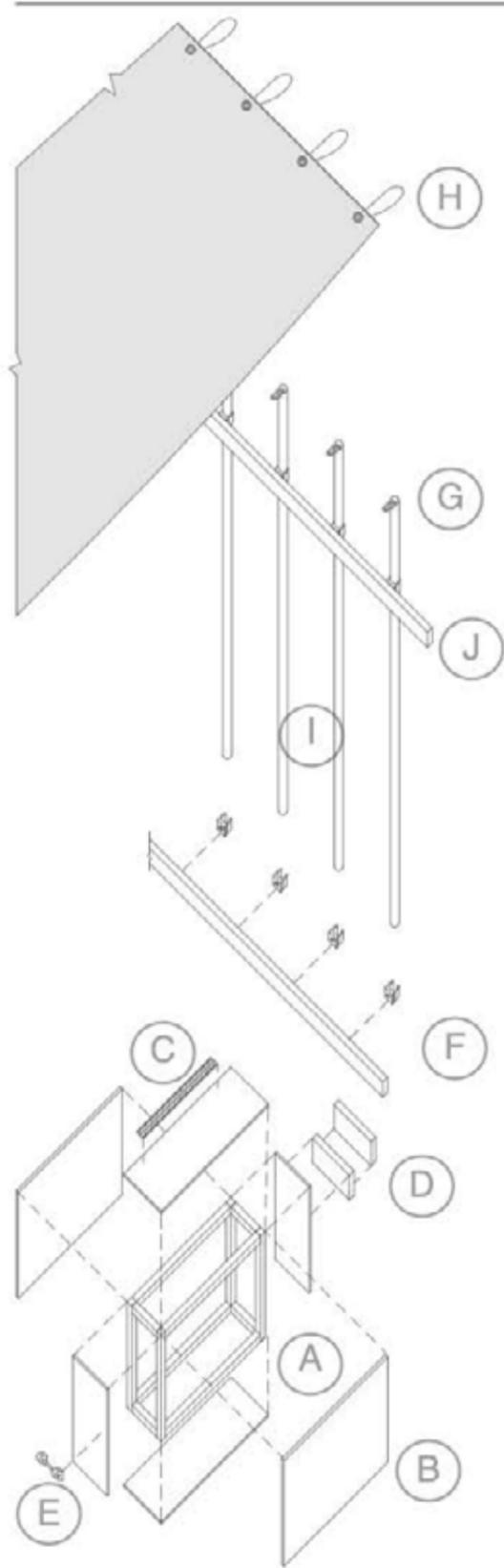
2" PVC

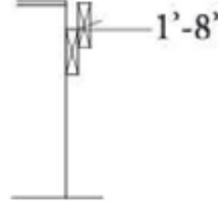


**BERNHEIM OUTSCHOOLED I "THE HAMMOCK" I DALTON SHEWCRAFT**



**DIRECTIONS**



- A. Construct frame of box (3'x2'x1') with 2"x2" wood. Attach with 3" wood screws.  
 4x - 2'-6 1/2"  
 4x - 2'-0"  
 4x - 0'-8"
- B. Cut & attach 1/2" plywood to frame with 1 1/2" wood screws.  
 2x - 2'-10 1/2" x 2'-0"  
 2x - 0'-11" x 2'-0"  
 2x - 2'-10 1/2" x 1'-0"
- C. Attach continuous hinge to top of box and side.
- D. Screw two 1' pieces of 2x6 lumber together in similar fashion and attach to rear of box.  

- E. Attach handle to front of box.
- F. Lay out (4) 2"x4"x10' end to end and secure clips 18" O.C.  
 -Ensure 3" clips for each end pole and 3" clips for middle 5 poles.  
 -Once all clips are attached, insert each 2x4 into respective places inside the 2x6 slot created in step D
- G. Drill 1/4" hole near the top of each PVC to insert steel caribener.
- H. Attach bungee to each grommet in tarp and attach to each caribener.
- I. Insert PVC pipes into clips.
- J. Attach additional 2x4 with clips onto erected PVC pipes 2' from the top.

**MATERIALS & COST**

2" PVC x 10'	= \$ 8.84	x40	= \$ 353.60
3" PVC x 10'	= \$ 19.74	x14	= \$ 276.36
2x4x10'	= \$ 2.36	x16	= \$ 37.76
2x6x8'	= \$ 10.27	x 3	= \$ 30.81
2x2x8'	= \$ 2.98	x15	= \$ 44.70
3" Conduit Hanger	= \$ 14.08	x28	= \$ 394.24
2" Conduit Hanger	= \$ 1.99	x80	= \$ 159.20
4x8 Sheet Plywood	= \$ 33.00	x15	= \$ 495.00
30 x 40 Tarp	= \$230.00	x 1	= \$ 230.00
9" Tarp Ball Bungee(25)	= \$ 15.14	x 3	= \$ 45.42
Caribiners (30)	= \$ 16.99	x 2	= \$ 33.98
Continuous Hinge	= \$ 9.99	x12	= \$ 119.88
3" Exterior Deck Screws(lb)	= \$ 9.47	x 1	= \$ 9.47
1-1/2" Exterior Screws(lb)	= \$ 9.47	x 1	= \$ 9.47

Subtotal = \$2,239.89  
 +6% tax = \$ 134.39  
**Total = \$2,374.28**

Options:

Planter Box (Wood)	= \$15.00/ea
Planter (Bucket)	= \$ 3.98/ea
10 x 12 Tarp	= \$24.44/ea
Table Top (OSB)	= \$31.25/ea

**TRANSPORT**



"The Hammock" can be transported within two pickup-truck beds.

**TOOLS NEEDED**



Basic construction tools and construction knowledge are needed to assemble "The Hammock."

**AWARD: FIRST PLACE,  
COMMUNITY CATEGORY**

**DESIGNER: Summer Garris, teacher,  
and Derek Heath, Layne Gribbins,  
and Brooks Brackett, students at  
Larue County High School**

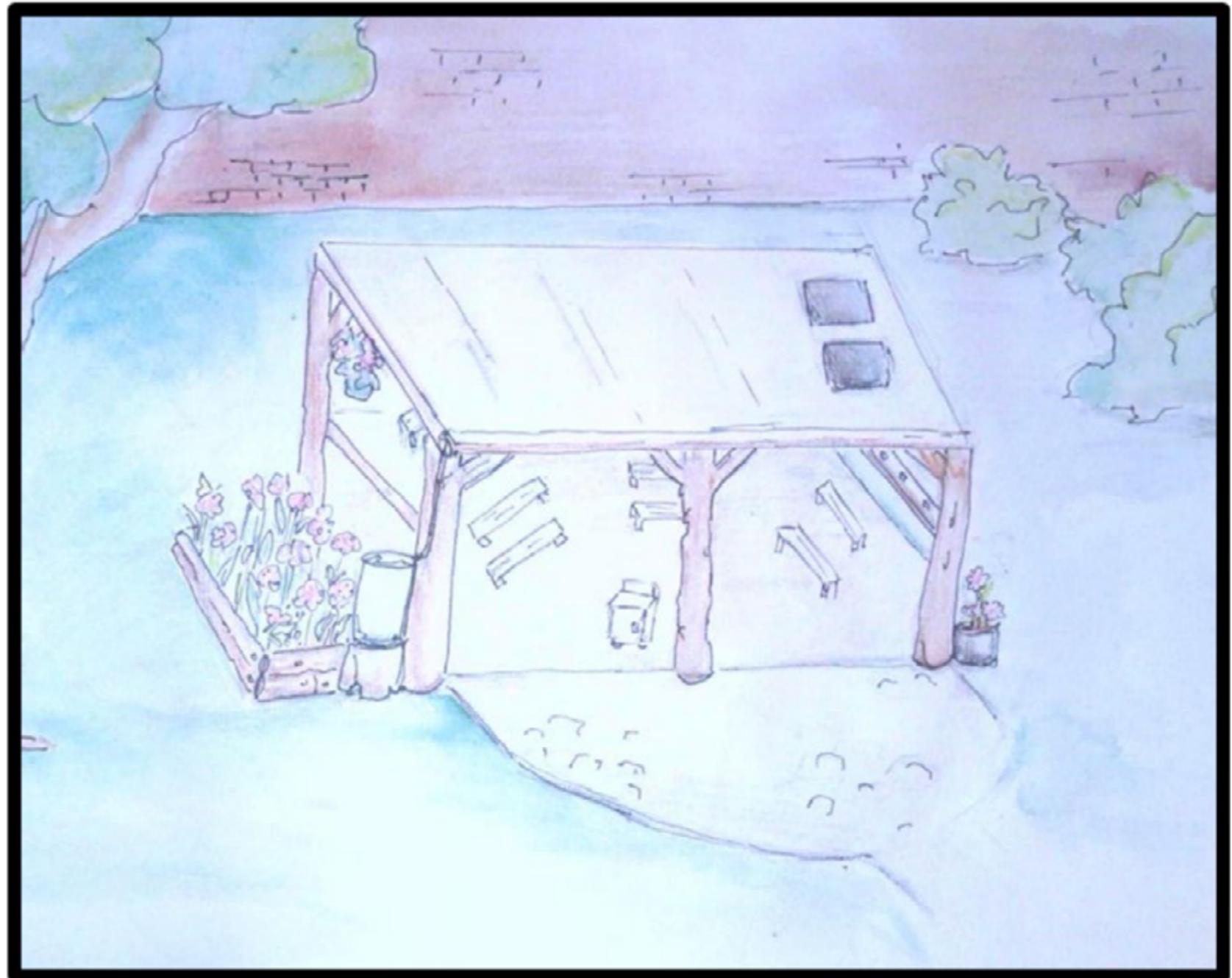
**LOCATION: Hodgenville, Ky.**

**TITLE: Outdoor Classroom**

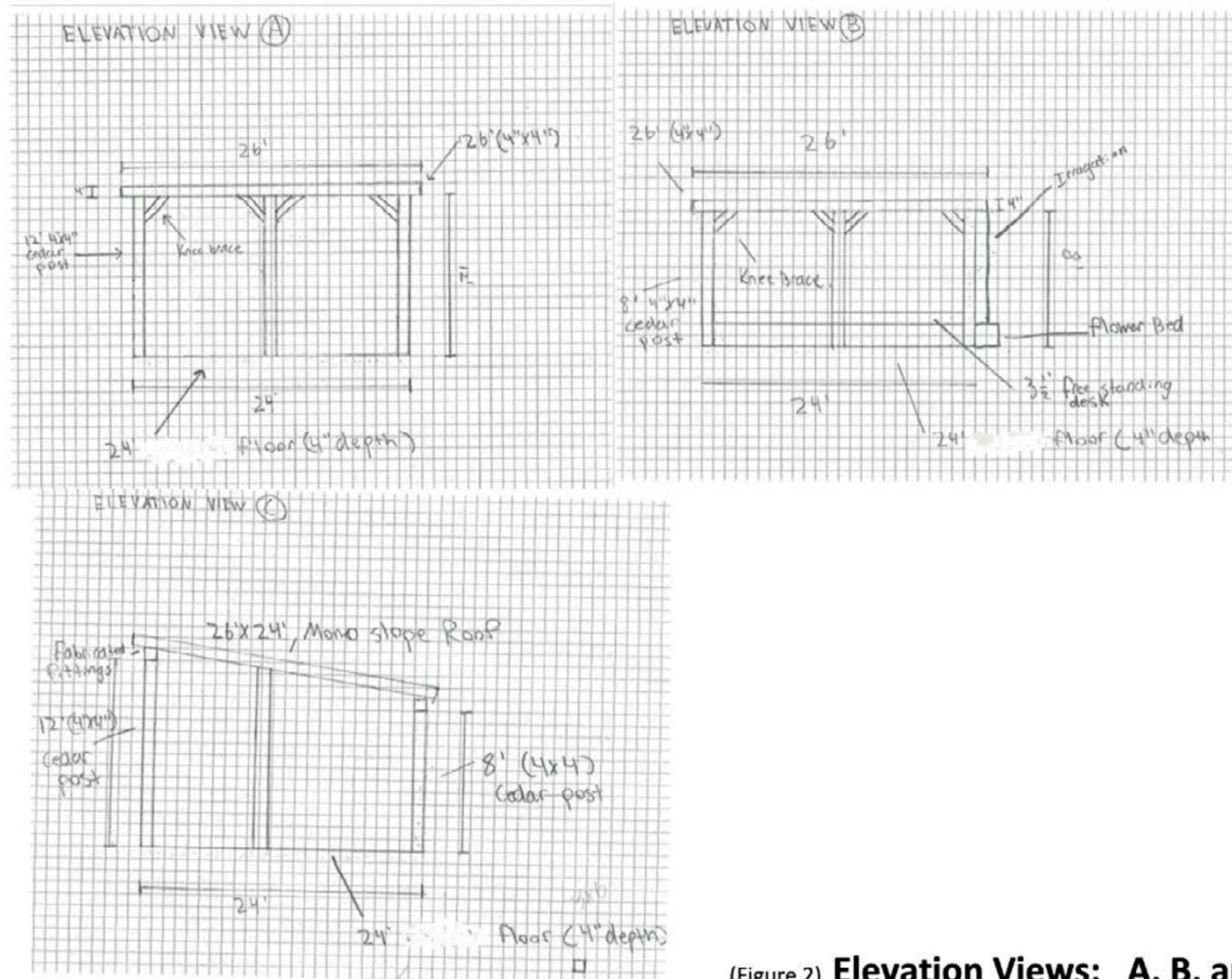
**What the jury said:**

“Great way to incorporate local history into the design and to use existing amenities thoughtfully.”

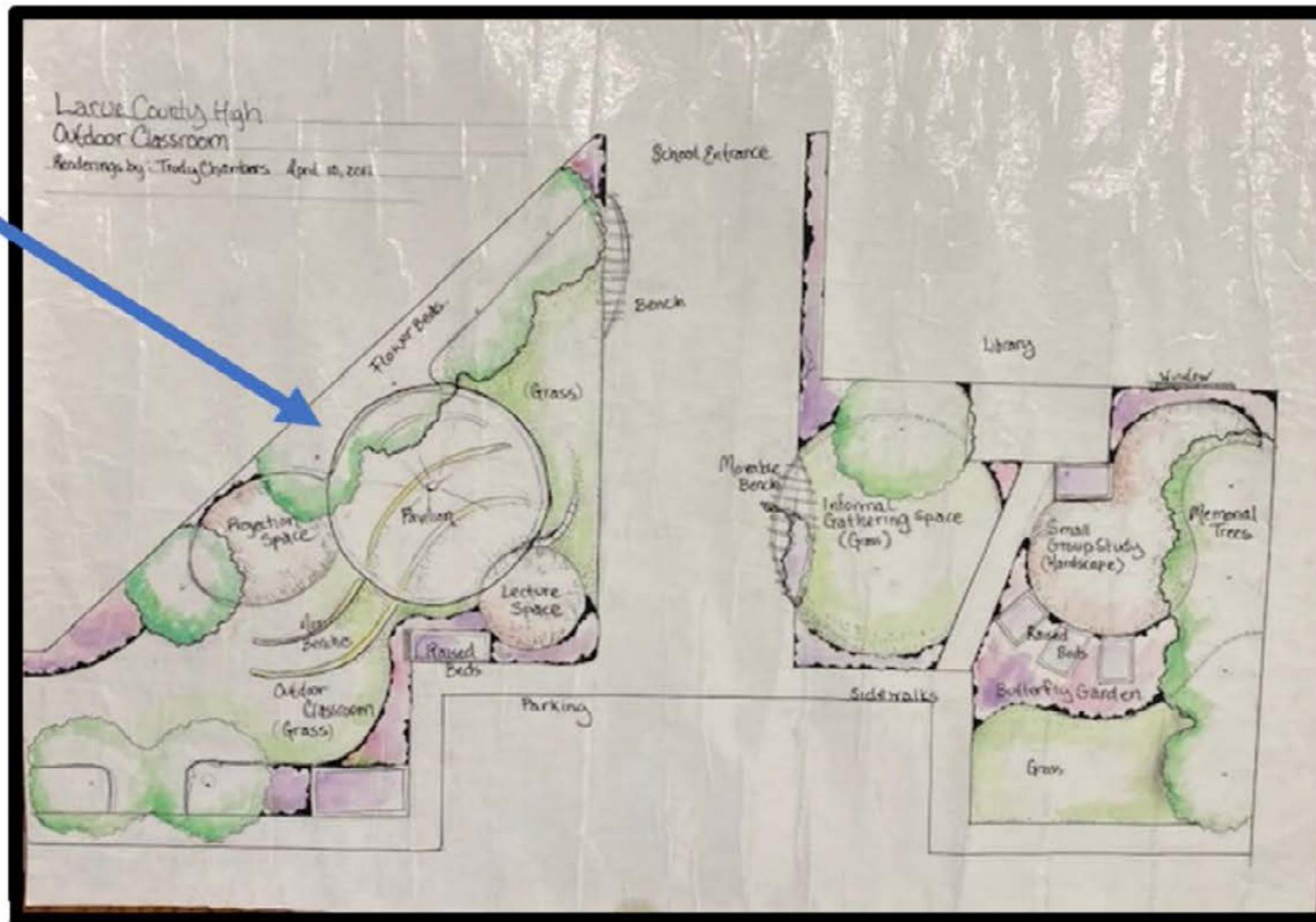
“I like that this proposal is coming from years of effort to engage children in more outdoor learning. And that submission of this proposal is potentially allowing them to move forward on their ideas. This is simple, achievable and appropriate to their stated needs.”



**(figure 1): Outschooled: Outdoor Classroom Concept**



(Figure 2) **Elevation Views: A, B, and C**



: Outdoor classroom context. This is a whole garden/outdoor space design commissioned years ago; it shows the context of the structure labeled "Pavilion." (design by Trudy Chambers, 2011)

**AWARD: HONORABLE MENTION,  
COMMUNITY CATEGORY**

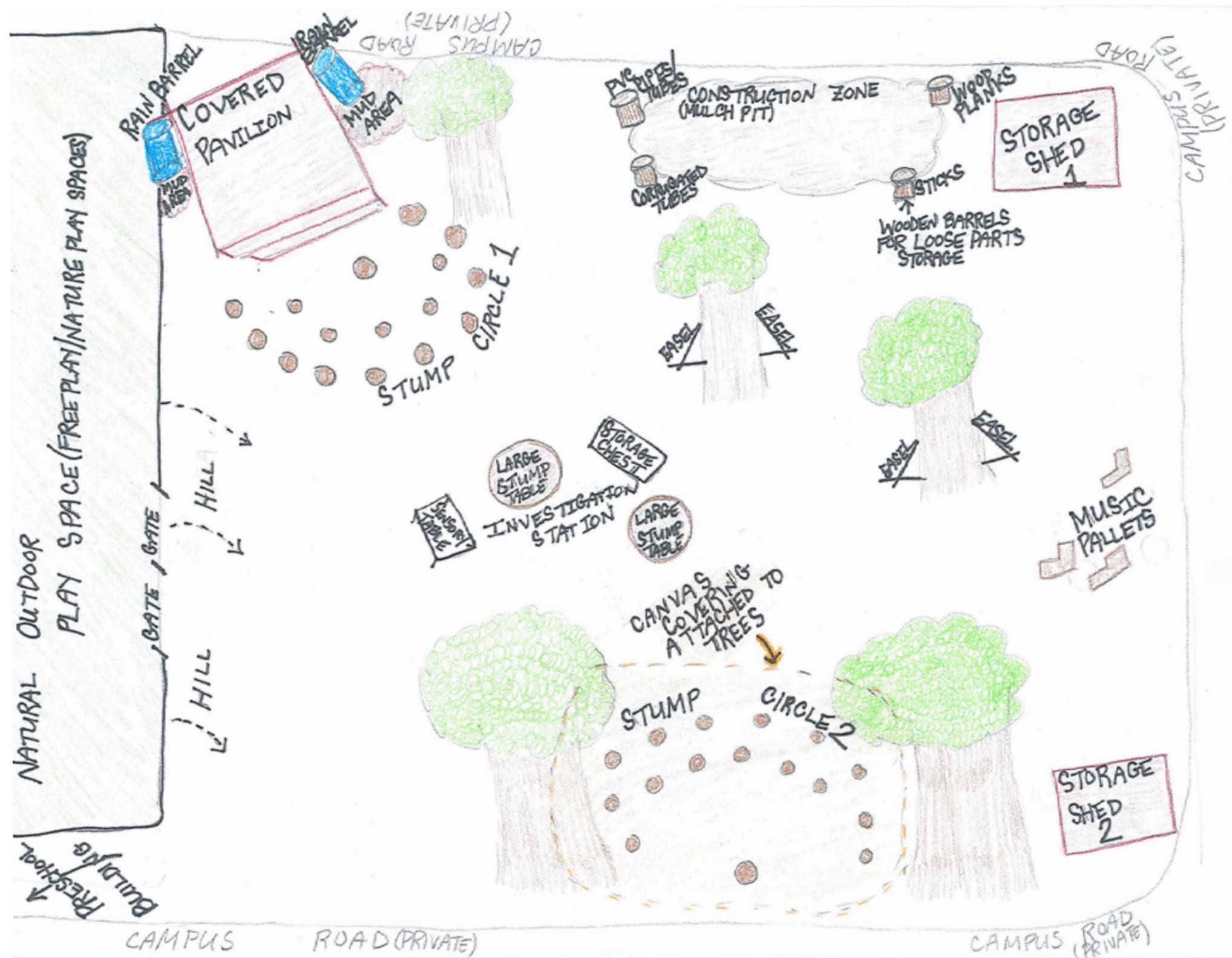
**DESIGNER: Austin Nikolich & the  
Nature PlaySpace Design Team,  
Sacred Heart Preschool**

**LOCATION: Louisville, Ky.**

**TITLE: Nature PlaySpace**

**What the jury said:**

“Appropriate concept of classroom space for early years groups. Thorough research of materials and options. The design is simple but encompasses a lot. Love the inclusion of art and music elements.”



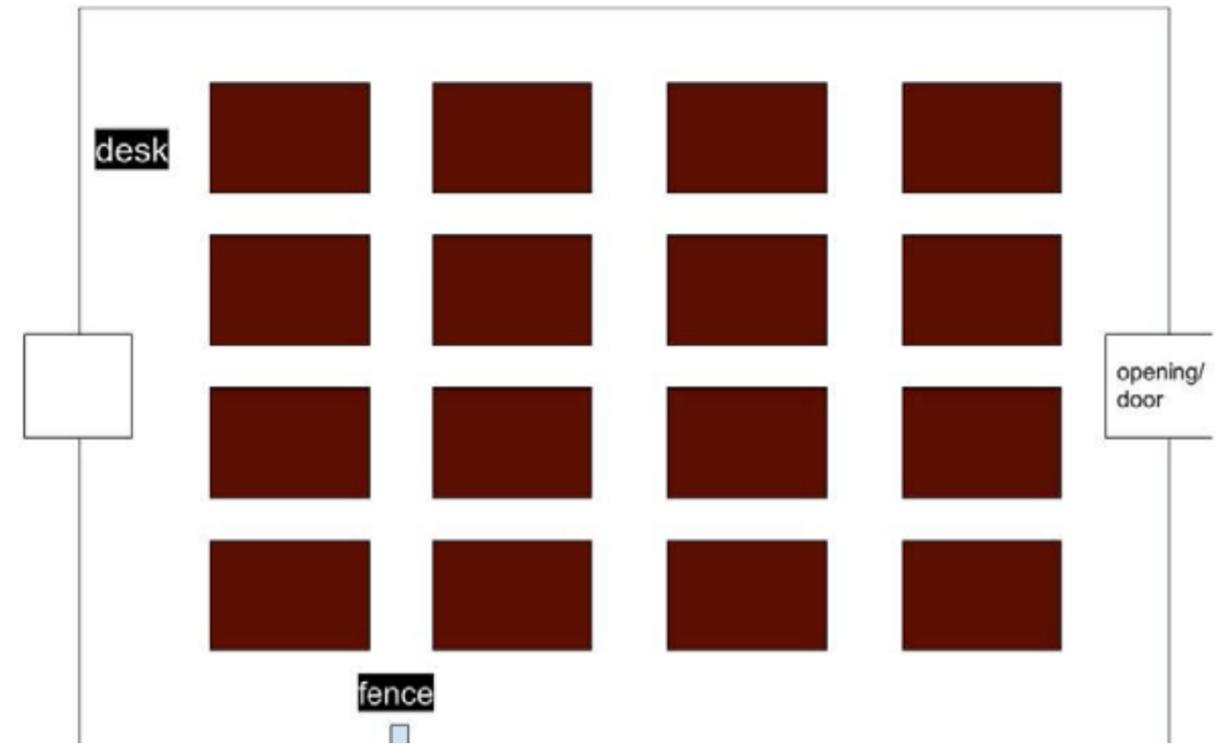
DESIGNER: Savannah Cambron  
 LOCATION: Lexington, Ky.  
 TITLE: Bernheim Outdoor Classroom

**What the jury said:**

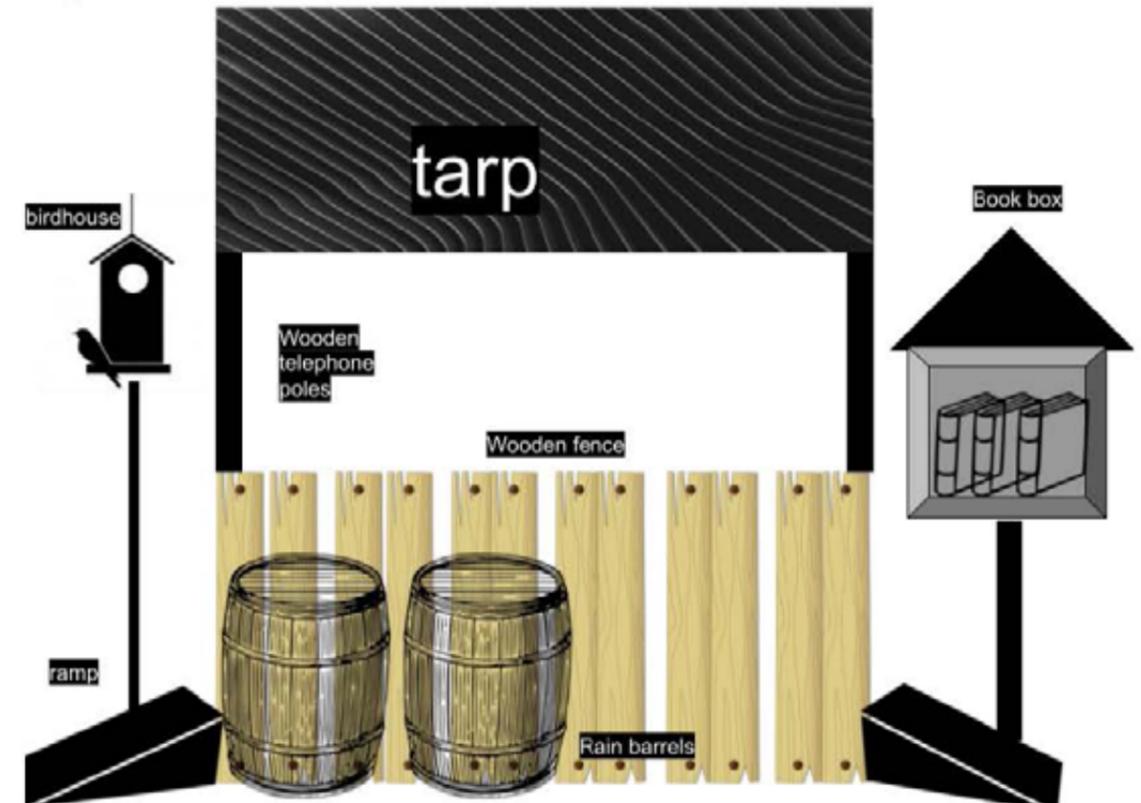
“Super impressed by the initiative, the poem and the illustration acumen. I think Savannah is a great designer and agent of change.”

“This was our youngest submitter, at age 11. So impressive! This was so thoughtfully done and the poem is just lovely. Very practical design and good use of recycled materials.”

**Aerial View**



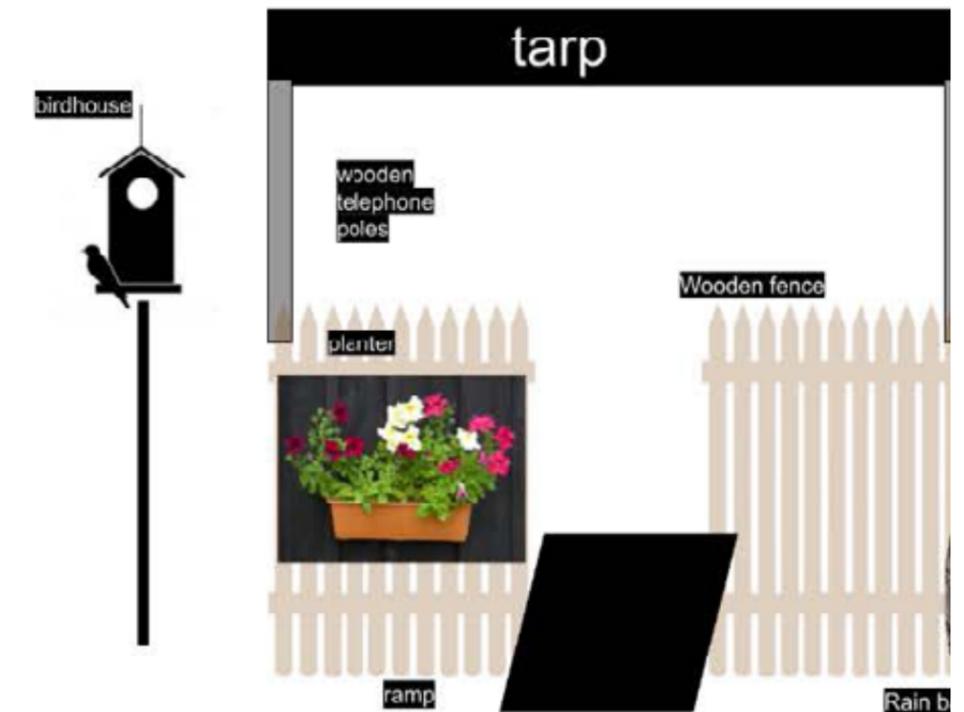
**Side View**



# Supplies Cost and Place

Item	Cost per 1	How many	Total cost	Place	Dimensions
Desk	\$25.25	16	\$404	lowes	pine boards (1"x12"x8'); \$20/each *4=\$80 6"x6"x10' pressure treated boards; \$54/each * 6 = \$324 (2 foot boards on top of posts buried in the ground)
Ramp for if elevated on ground (optional)	\$51.99	2	\$103.98	Recycled aluminum at lowes	See at lowes
Wooden fence		Needs to be cut	\$396	lowes	See at lowes
Rain barrels	\$40	2	\$80	blue barrel system	See at blue barrel system
Recycled telephone poles cut in half for support of tarp	\$350	2	\$700	<a href="#">(Recycled Utility Poles   National Salvage &amp; Service Corporation)</a>	See at <a href="#">(Recycled Utility Poles   National Salvage &amp; Service Corporation)</a>
Tarp-recycled vinyl	\$126	1	\$126	<a href="https://www.repurposedmaterialsinc.co">https://www.repurposedmaterialsinc.co</a>	See at <a href="https://www.repurposedmaterialsinc.co">https://www.repurposedmaterialsinc.co</a>
Planter and plants	\$40=planter \$1=plants	1	\$41	Find the planter on amazon and the plants at your local market/greenhouse	See the planter on amazon and the plants at your local market/greenhouse
Recycled Birdhouse and bird food	\$6=house \$30=seeds  (You could also just use fruit)	12	\$78 (because it's a deal package with the bird seed)	birdhouse=greenbirdhouse.com  seeds=wild bird unlimited	See at greenbirdhouse.com
Book box	\$25	1	\$25	roof shingles donated from color swatch/contractor \$0; leftover wood + posts \$25	However big you want

## Other Side View



**Total Cost: \$1,953.98 (not counting hardware like nails etc.)**

Extra money is used for the Hardware.

Also here is a poem that I wrote that describes why having a outdoor space is important to me because it said that poems are encouraged in the directions

“Look around At the water and the ground

There's always color In the fall and the summer

Beautiful trees And buzzing bees

But all of this could float away

So lets take action starting TODAY”

DESIGNER: **Claudia Markel**  
LOCATION: **Lexington, Ky.**  
TITLE: **Green Roof Classroom**

**What the jury said:**

“Well crafted illustrations. I love the living roof concept and solar panels. Very thoughtful attempts to reduce, reuse, recycle materials and included green roof and solar panels.”

“Very substantial structure. I like the inclusion of a wall for teacher presentation and the lockable storage closet.”

