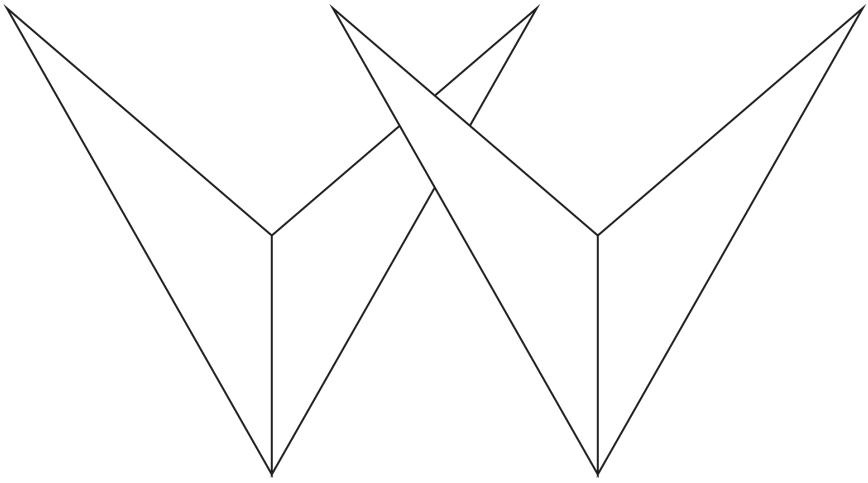


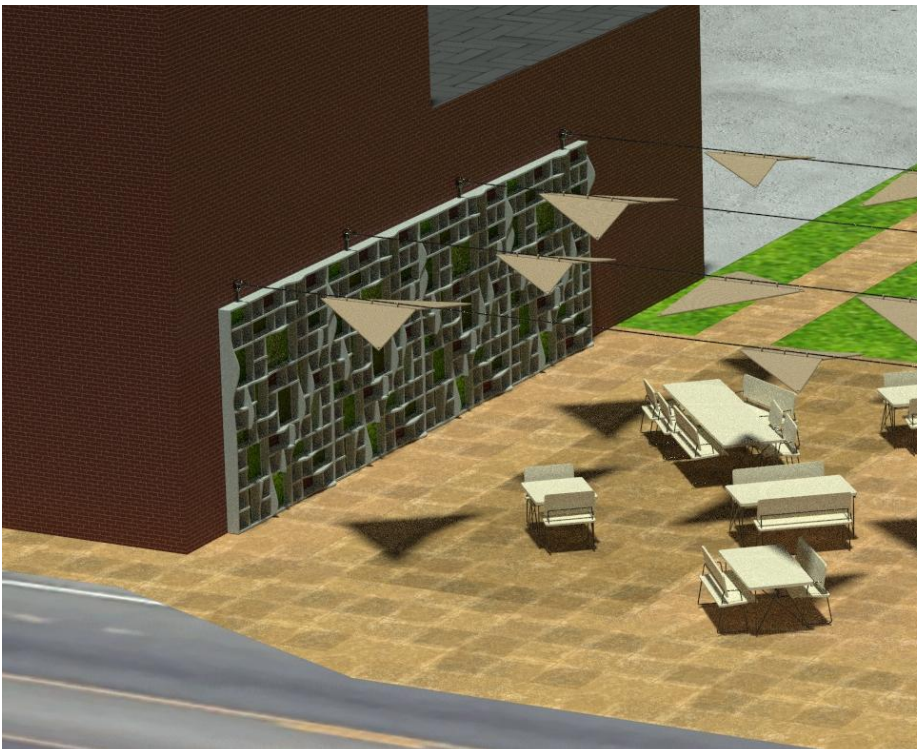
WRIGHT CONNECTION

COWORKING HUB

DOCUMENTATION
AND PROCESS

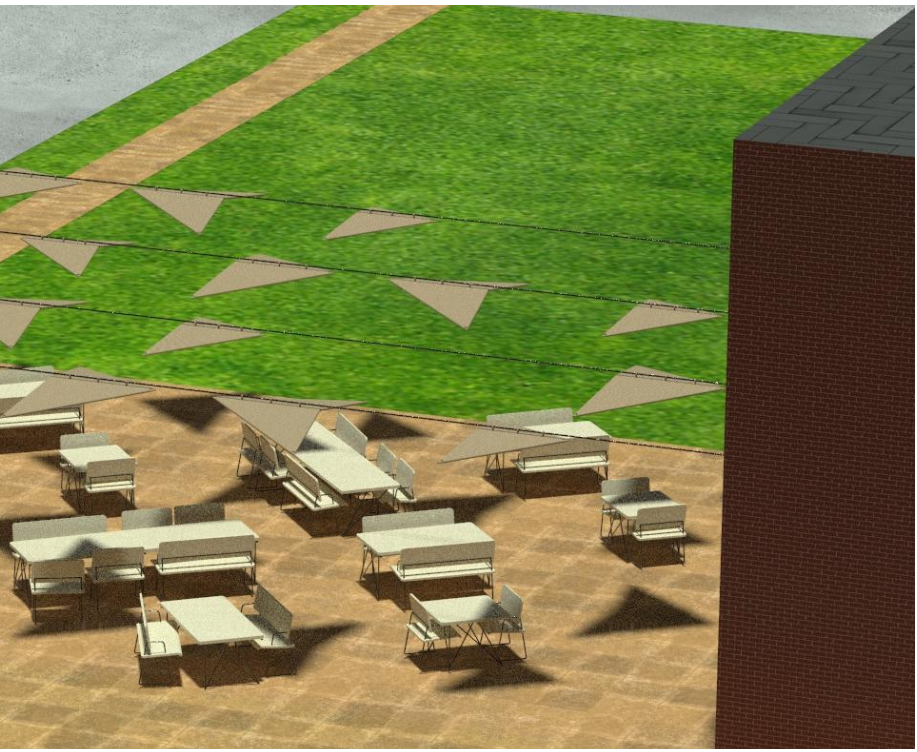
ALLISON CASHMAN
KATE BELLIVEAU
MAE WELTY

Table of contents



ABSTRACT

The National Aviation Heritage Area presented Ohio State's Desis Lab with the opportunity to create a coworking space on their property in the Wright-Dunbar neighborhood of Dayton, Ohio. This project proposal is the result of disclosed needs brought forward by the Rediscover Dayton Action Plan, a plan designed by volunteers and community members.The objective is to create a space that invites community members from all socioeconomic landscapes to gather in a space, reminiscent of the Wright Brothers, that supports productivity and connection.



In an effort to invite community members to the historic Wright-Dunbar neighborhood in a post pandemic world, the design for a communal work space is intended to promote productivity in accordance with recent changes to the way working professionals perform their tasks. The location site presented a large opportunity for design implementations for the three students to address hand-in-hand; the solution consisted of the designs of an expanded walkway, working furniture, a noise absorption structure, and a weather management design.

The Wright Connection Coworking Hub offers a communal work space in the urban downtown setting. The hub is designed to honor the legacy of the Wright Brothers while providing a unique place for innovative conversation and collaboration between individuals, companies, co-workers and even new partnerships. While working outdoors, professionals still have access to the necessities of the office, shade from the sun and dampened sound from the surrounding urban rumble. Wright Connection brings purpose to the site while also providing the local businesses, neighbors and downtown professionals a space to gather, work together, and join in the community celebrating the history of the historic lot.

INTRODUCTION

THE PROJECT

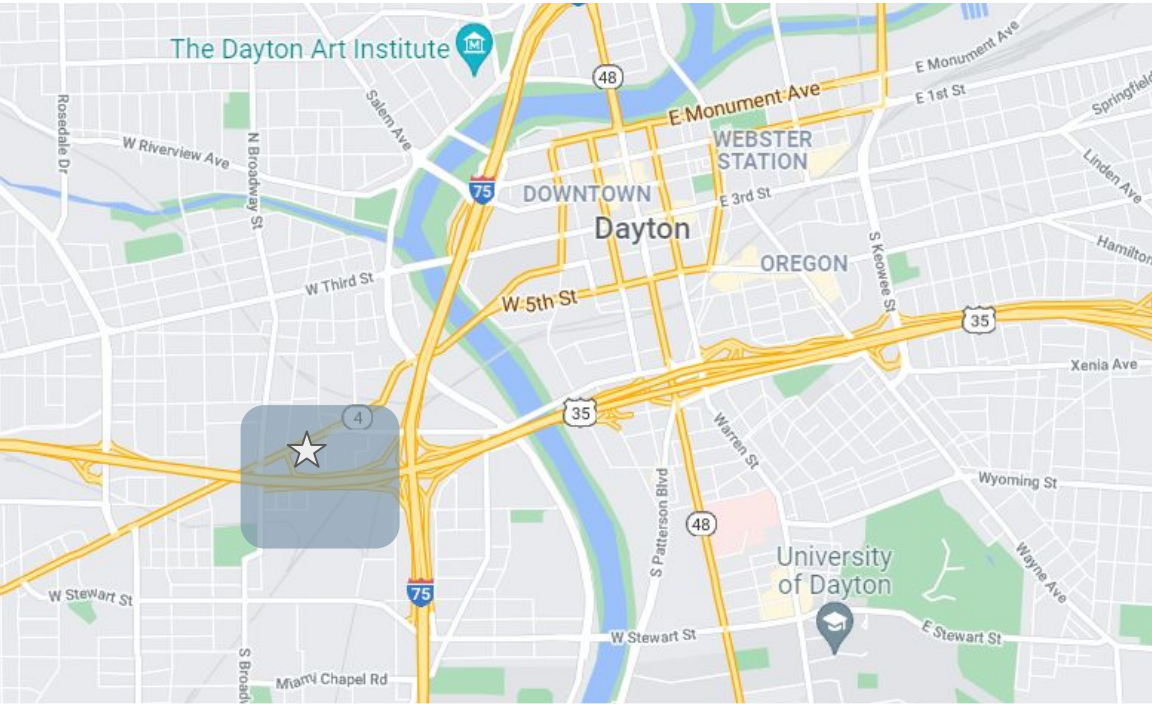
The project is centered around the revitalization of an urban space in the historic Wright-Dunbar neighborhood centrality of Dayton, OH. The intention of inviting community members back into the business district in a post pandemic world will be explored through extensive research and thoughtful design implementations. The historic site in Dayton, OH, will be revitalized as a communal space for creativity and productivity to flourish. The site's address is 1127 W 3rd St, and is the former home of the original Wright Brothers cycling shop. The open, grassy plot is now empty and being reimagined for an outdoor co-working space for the community's members. The project seeks to provide the community with a space for work and collaboration, in the midst of new developments in a diverse landscape.

Productivity can be defined by the efficiency of one's work; but what happens when elements outside of your control distract from the goals you have set in place for yourself? Current trends in working from home, being completely remote, and working hybrid have changed the way working professionals complete their daily tasks. Current trends include co-working spaces that have popped up all over the world, especially in larger cities. Through the success and failures of these startups, we are able to evaluate what is working for remote workers, and what needs revision.

INTRODUCTION

THE LANDSCAPE

Among the various developments coming to the Wright-Dunbar neighborhood centrality are market rate apartments, and an adjacent up and coming food hall. The National Aviation Heritage Area is also in close proximity, which employs the individuals who presented us with the design opportunity. This project proposal was a result of the disclosed needs of the Rediscover Dayton Action Plan, a plan designed by volunteers and community members that highlights the objective of creating a space that invites community members from all socioeconomic landscapes to gather in a space, reminiscent of the Wright Brothers, that supports productivity and connection. The space will be designed to provide an alternative work environment, other than home or office, supporting productivity, concentration, and inviting community members to connect with each other. Various factors of the space include a busy street front location, small local businesses, strong diversity, and nearby residential homes. Community members, familiar with the cultural landscape, value upholding the areas rich history, and outlining a primary attribute of the project.



As the area undergoes development, serving the needs of the current residents is vital in evading negative impacts of gentrification and preserving the local diversity. Design efforts will be tailored toward uplifting the community through thoughtful adaptations for outdoor usage in an urban setting. In order to avoid developments negatively impacting the current community members, the space must align with the current building codes and aesthetics to promote utilization from individuals already in the area, to ensure the locals are not being pushed out, and/or unrepresented.

THE STAKEHOLDERS

Stakeholders for this development opportunity include the professionals of Dayton, OH, including freelancers, downtown office workers, their clients, and those who work remotely or hybrid. Another group of stakeholders include the local business owners, including the surrounding stores and their owners/employees.

These community members play a significant role because these individuals rely on the economic activity in the immediate area. Local residents, individuals who pay taxes and make up the Wright-Dunbar community, are essential in curating a space to be used by the current residents. A group that plays a pivotal role in bringing this concept to life is the National Aviation Heritage Area (NAHA) members. The individuals who make up the NAHA have professional interests in the success of this senior thesis project and surrounding community, as well as those who maintain the property. Additional stakeholders include visitors, which can be defined by those who enjoy the history of the Wright Brothers, marking the significance of the location. Dayton students also make up a population of users to be considered for this space, including those commuting from University of Dayton and Sinclair college, composed of individuals who want a new creative space to meet and collaborate. Lastly, Dayton creatives, such as freelance artists will be another group of individuals who are stakeholders in this project. The opportunity is intended to serve the interests of community members and all stakeholders listed previously.

RESEARCH METHODS

In order to address the necessities of a communal work space, information regarding downtown Dayton, the local history, and existing coworking trends were explored.

Secondary Research
To begin the research phase, secondary research was carried out to gain a broad idea of prevalent background information. This was done by finding articles, photos, pieces of writing, and art to study and analyze. These were broken down into five categories: main focus, science, technology, arts and business methods.

Ethnography
Attending an outdoor pop up coworking event allowed us to study the way they were used, noting the pros and cons of working outdoors as well as understanding the general use by professionals.

Co-Design
A block building activity was intended to be a creative way to gain an understanding of what people consider essential to a work space in terms of layout and work spaces.

Adjacent to that activity, an image collage activity was performed with 10 participants to understand what best represents the city and the community.

Survey
Surveys were conducted to gain primary insight on the perceptions and attitudes toward co-working as well as local community members thoughts and perceptions toward downtown Dayton.

Interviews were also intended to gain primary insight of thoughts and perceptions from those living and working within the Wright-Dunbar neighborhood.

Space Design
The space itself needed to be measured and understood to critically analyze how users would be approaching the space and moving within it.

Design Conjectures
Design conjectures were used as a research method to think through possible avenues and be be critical of and learn from initial ideas. These are several initial “bad concepts” and what we learned from them in order to push past the first few ideas.

SECONDARY RESEARCH

Revamping Dayton, Post-Pandemic

Allison Cashman · September 1, 2021

Biophilia in the Urban Setting

Allison Cashman · September 1, 2021

The Perfect Co-working Space

Allison Cashman · August 31, 2021

Moving the Office Outdoors

Allison Cashman · August 31, 2021

Clever Park Cuts Airport Noise Pollution In Half

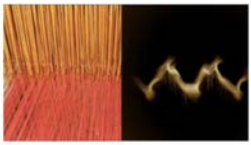
Mae Welty · October 11, 2021

Summary Some airports are experimenting with a new solution: Land art that disrupts sound waves while doubling as a...

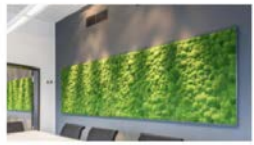
Four ways workplace art can boost productivity

Mae Welty · September 28, 2021

A body of research exists explaining how well-thought-out office art can inspire staff and increase wellbeing and productivity. Having art around you...



Some Parallels in Textiles and Composition



Acoustic Moss Wall Panels

Mae Welty · September 28, 2021

Wright Flyer III at Dayton Aviation Heritage National Historical Park

Kate Belliveau · September 14, 2021

Like any other national park in the country, it's the people, the places and the stories which form the heart and soul...

Modular School and Work Popups

Kate Belliveau · September 14, 2021

American architecture studio SOM has created a design for a ventilated, high-ceilinged, modular classroom for schools that need temporary accommodation.

Blending Indoor and Outdoor Design

Art In The Workplace

Kate Belliveau · September 14, 2021

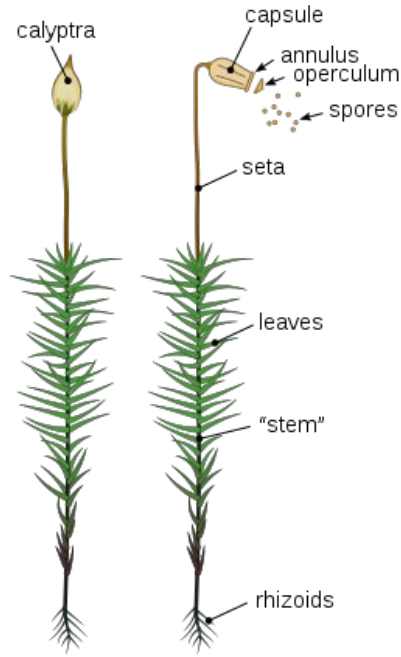
Secondary research surrounding sound management techniques that stood out were implementing natural elements, such as plants, because of the sound absorption qualities as well as its ability to make a strong visual impact.

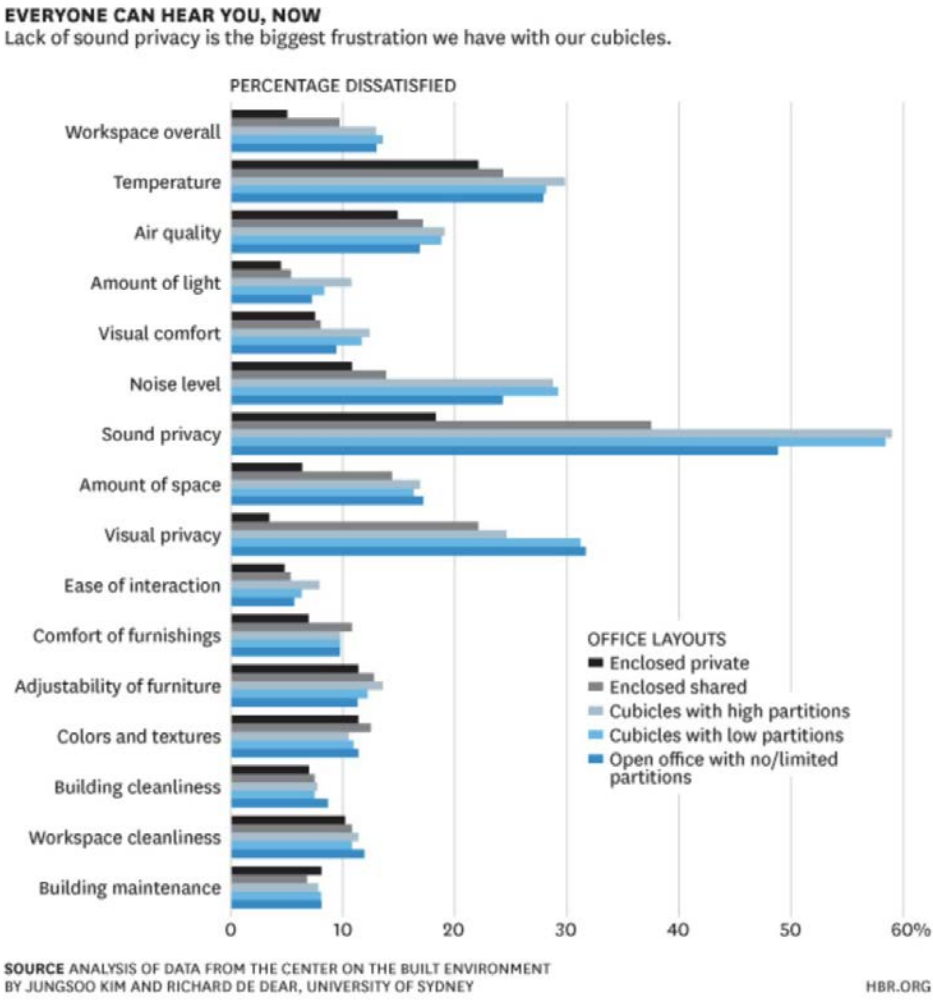
Moss became a top contender due to the plant being extremely low maintenance, as well as a common method of bringing biophilic properties to work environments.Moss does not have typical plant roots, instead they have root-like structures called rhizoids.

Rhizoids function for attachment and water absorption.

This is why moss can grow on various surfaces, such as rocks.

Living walls bring an opportunity to include nature in urban landscapes, while also providing the opportunity to dampen the noises that are built in to the environment.



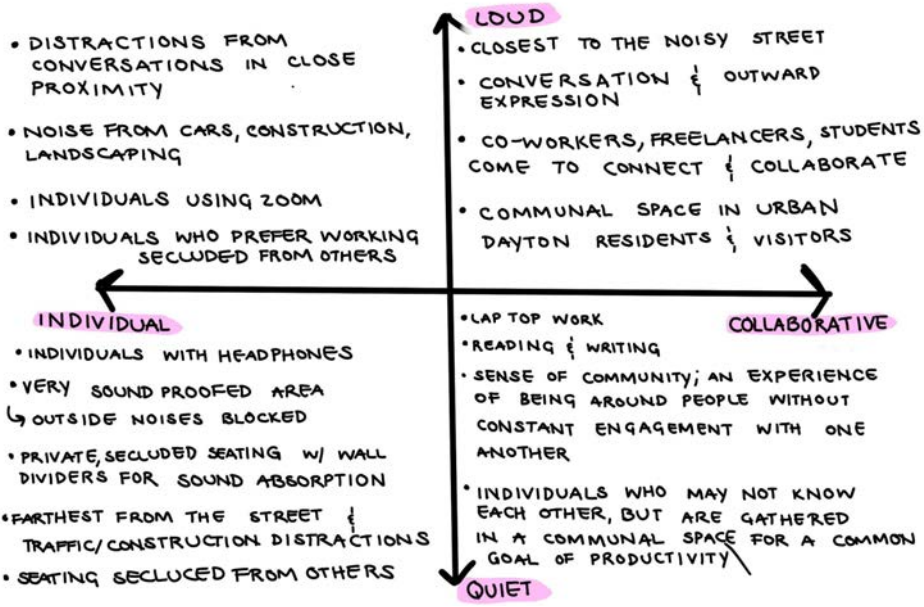


This study from The University of Sydney found that a lack of sound privacy was biggest drain on employee morale

This study was cited in various articles that focused upon common distractions in the workplace. Noise privacy and sound disruption stood out as common concerns among workers in offices and connected back to the initial concern of urban noises being an issue for the outdoor work space

We had the opportunity to observe an outdoor coworking event, where professionals could work using wifi hotspots and electrical outlets. The Corrugated metal tables were not compatible with computer mouses.

Tables and chairs were littered with natural debris and almost everyone set their work bags directly on the ground where cords from electronic devices were also snaked.

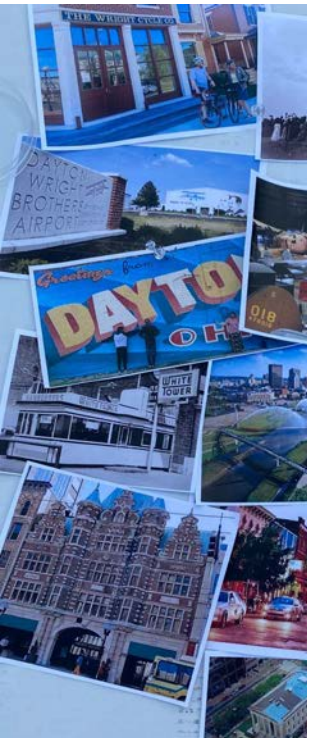


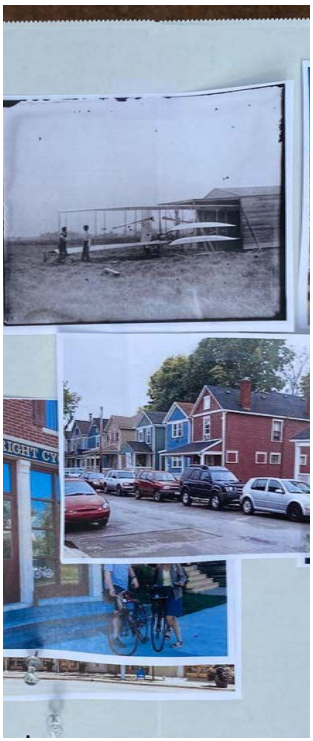
glasses charger paper notepad laptop bag phone pen computer

Data from the ethnographic observation shows that there are consistent things that professionals need in order to be successful if working out of the office, like their phone, laptop and writing materials. The majority of these items **require a stable work surface or seating** for the user when interacting with them, in order to be productive.

RESEARCH

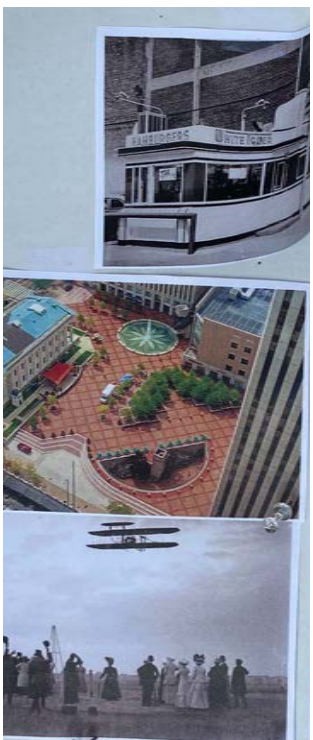
CO-DESIGN

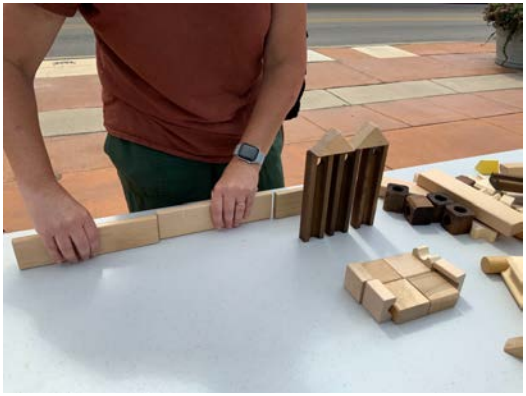




At the property site, co-design research was conducted with community members through an image collaging activity where participants were asked to arrange images and visuals of Dayton in order to *best* represent the city.

Consistently, participants chose images that represented a historic or artistic vision of Dayton, but most importantly felt proud of the history of the Wright brothers.





The block building activity served as an activity where participants could make and build what they considered their ideal work environment. Given zero constraints of what individuals could or could not include, participants were able to provide an idea of the various factors that are considered important to a work space.

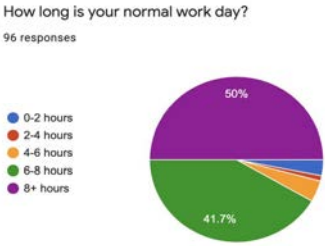
The findings varied between participants, but certain aspects were consistent. Among almost all participants was a notable desire for individual and collaborative work areas. People often acknowledged how connectivity and conversation are a significant factor when getting work done, while noting certain tasks are only performed by an individual.

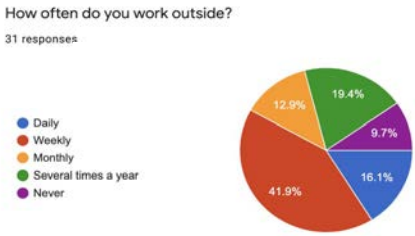
Despite these findings being relevant to constructing a co-working space, what really stood out as significant was the inability to communicate with participants due to noise in the area being disruptive and distracting. Landscaping was the main source of noise at the time, however this led to bringing additional awareness of sounds of traffic and the adjacent construction site.

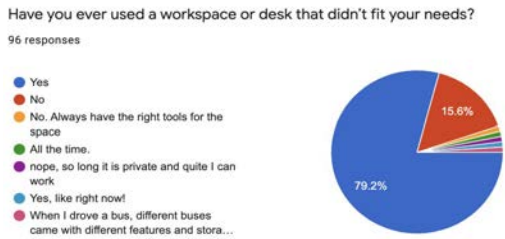
Landscaping

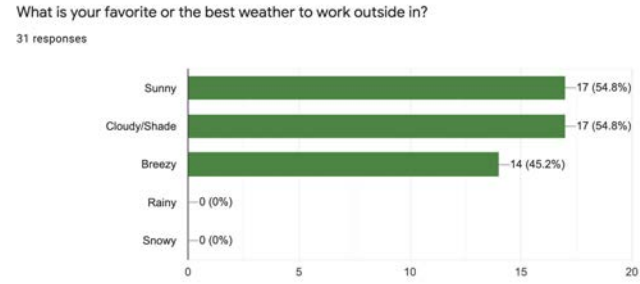
Construction

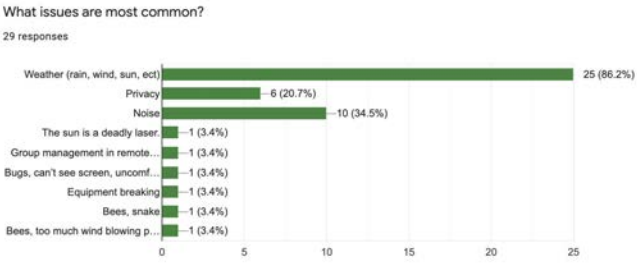
SURVEY











Initially, a variety of surveys were sent out across multiple social media platforms including Facebooks, Instagram, and Reddit. The majority of the questions asked and answered were about co-working spaces in general and what effect they had on the participants lives. As initial research continued, the questions that were asked were narrowed down to the topics that we would be designing for: seating, noise, and weather.

IN PERSON SURVEY:

Do you live in downtown Dayton?
What is your most common use of transportation?

Please list your most commonly used items that you have in your work space.
- What of those is the most necessary one?
- Do you have any items that you always carry with you because your work space does not supply them?

What makes your space feel productive?
What is your work routine?

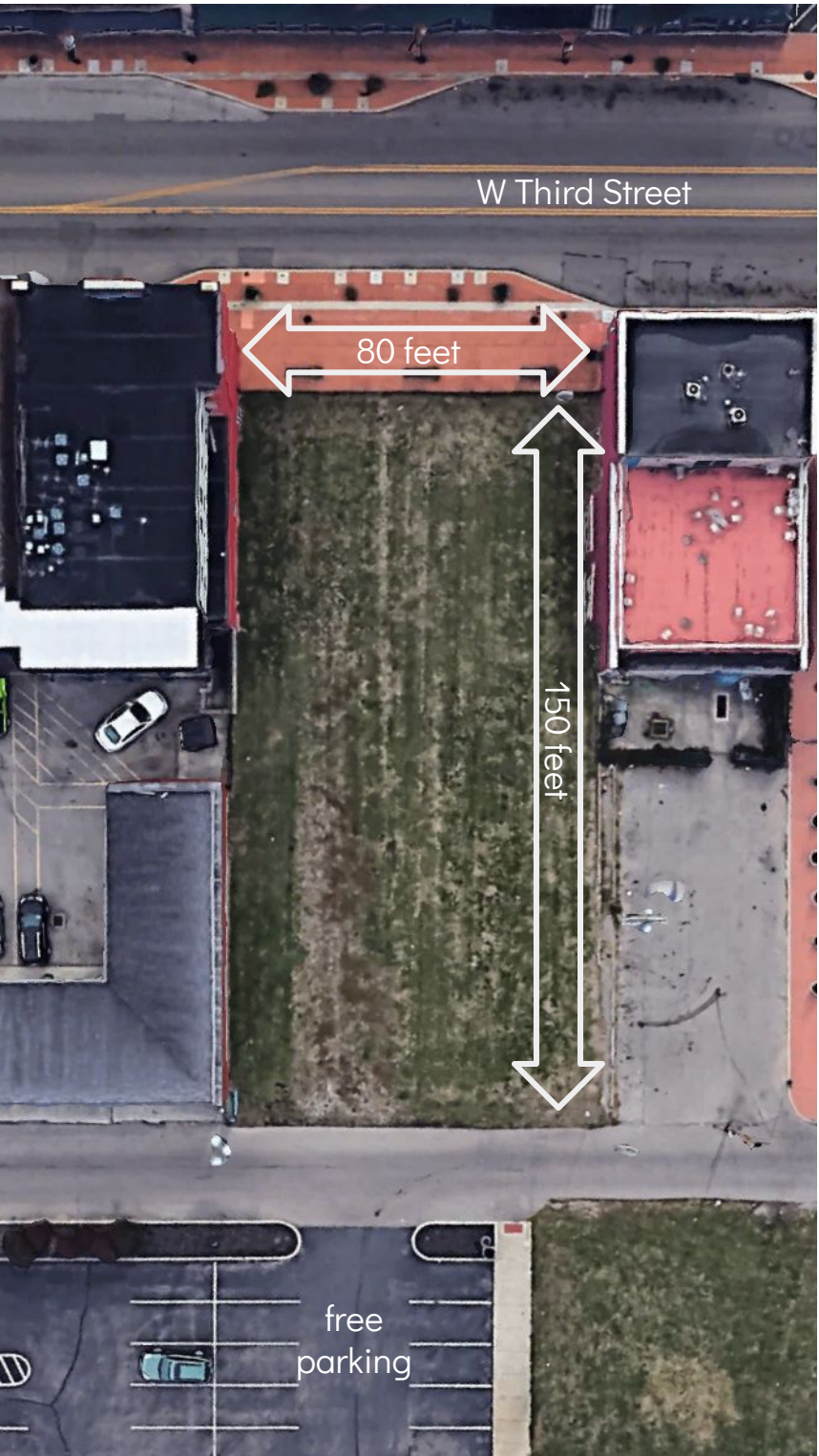
Do you know what a coworking space is?
- If yes, have you used one before?
- If not, would you like to learn about them?

What is your best guess of what a coworking space is?

When you are working with people…
- How many people do you work with?
- Do you use table space?
- Do you use white/pinboards of any kind?

At the location, a verbal survey was conducted. Here, questions were asked in a semi-structured manner. It became a conversation rather than a interview. Through the survey, most participants said they have heard of co-working spaces but haven't used them. Many wanted to know more about what they were and the opportunities they offered.

In another section of the verbal survey, participants shared what their daily work routine looked like; where they worked, what their office space was like, and how close they worked with others. Most said when the pandemic hit, they tried to change their workspace because they needed a change of pace from just their home office.

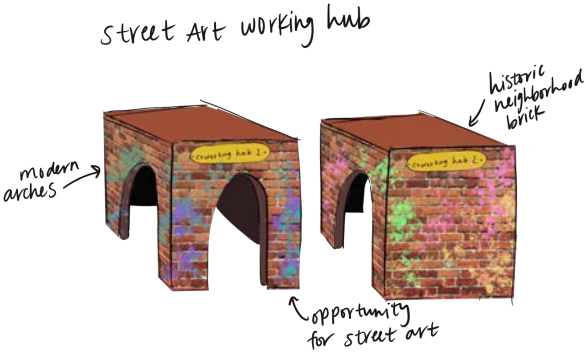

W Third Street
80 feet
150 feet
free
parking

Designing on this 12,000 square foot grassy piece of land meant considering the access from the front of the property, at W Third Street, to the back of the land, where a free parking lot is located. Access to the property is also met with the need for the space to be compliant with the Americans with Disabilities Act, so all users can navigate the site equally.

RESEARCH

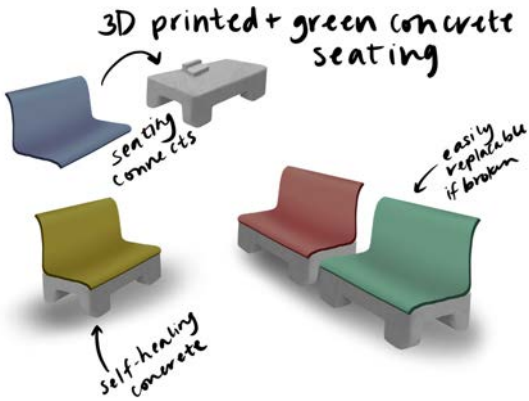
CONJECTURES

Design conjectures were used as a research method to think through possible avenues and be be critical of and learn from initial ideas. These are several initial “bad concepts” and what we learned from them in order to push past the first few ideas.



This design conjecture not only embraces the modernity of arches, but the historic brick and street art appeal of downtown Dayton. These unique “hubs” would be designed for groups or individuals to sit with one another in privacy from the other groups of professionals. The brick would allow local artists to create unique pieces of art, perfect for drawing members of the neighborhood for a photo-op.

This conjecture has a unique start on how to incorporate materials and artistic themes of the neighborhood into a worksite, but could be considered “loud”. A note to consider from here would be drawing back and incorporating more subtle elements from the neighborhood into the design, that don’t necessarily need to be obvious.

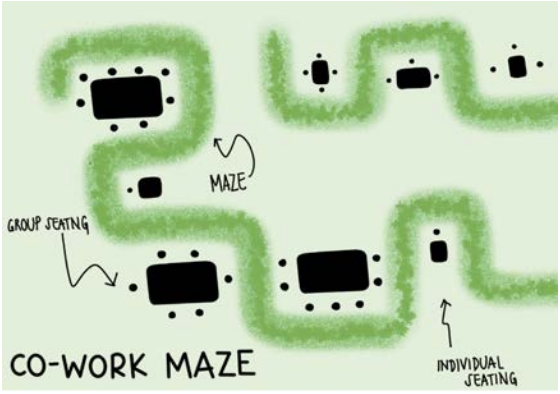


The push toward 3D printed furniture has so many positive assets and is extremely resourceful. If any piece becomes broken and needs replaced, the designed file would simply just need reprinted. If the bench piece is printed locally, the emissions needed to take it to the site would be relatively lower than ordering it overseas or across the country. This also helps stimulate the local or Ohio economy by purchasing local.

Considering these materials was a good design direction. The next step would be sourcing local companies capable of this process, to ensure the community aspect would be upheld in the design. The design itself is missing a work surface but the materials could be considered.

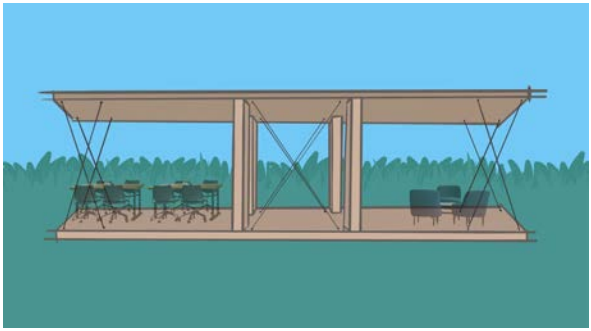
RESEARCH

CONJECTURES



Moss is not only aesthetically pleasing, but serves various other functions. Moss is a natural sound absorber, making it an ideal solution for areas that are prone to disruptive noise. This conjecture is intended to explore the strong visual impact moss that as it serves other types of functions. In high traffic areas, they can be strategically placed on a wall's reflection points to deaden sound, creating a much calmer environment. This method explores how moss and biophilic installations can also serve as art that can help to boost productivity.

The exploration of mazes was considered because it can break up the large outdoor space into different work areas using natural components. This concept expands on ways to promote proper sound absorption from moss while creating dedicated work spaces. The form of the maze can also be arranged to provide individual and communal areas, promoting productivity for different types of users.



Starting to think about weather elements while working outside, this conjecture was created. The structure of this idea was based on the Wright Flyer's shapes and materials. Having a solid floor keeps the table and chairs underneath from sinking into the ground, especially when there may have been heavy rain causing the ground to be soft and muddy. A similar structure being placed above the tables and chairs offers protection and shade from the elements. These include heat from sunlight, keeping sunlight from reflecting off technology screens, and protection from rain.

Materials following the Wright Flyer would include ash wood and metal rods for detailing and supporting structure. Using a thicker element, like the wooden posts in the center of the structure, indicate that there are three "separate" spaces.

INSIGHTS

01

professionals treat co-working spaces like their real offices

02

the community of Dayton is proud of its history and innovation

03

co-working spaces don’t have to look like a traditional office

04

noise is a common distraction in work environments and a built in factor of urban landscapes

05

different materials can change the outcome of the protection provided from the elements

INSIGHTS

PROBLEM STATEMENT

This space is in need of a place-based installation that professionals will actually *want* to use.

Professionals want to use coworking spaces as unique non-traditional offices, while still requiring the basic elements that make an office usable.

walkways

work surface

seating

The opportunity space is located on a busy street in a developing area in downtown Dayton.

The brick walls that surround the space reflect sound, amplifying noise pollution in the area.

In order to develop a work space that promotes productivity, a living wall will be designed to absorb noise to manage sound and limit distractions.

sound management

Outdoor co-working spaces offer a place for people to collaborate or simply enjoy working outdoors. While working outdoors, people can encounter weather related issues.

By creating a structure that could aid these weather related issues, the members of the community can work outside in confidence.

weather management

Objectives

The space was designed to:

1. Honor the innovative spirit of the site through providing a collaborative space for multiple individuals to gather at the same time
2. Provide an alternative work environment, other than home or office
3. Support productivity
4. Allow for concentration
5. Be enjoyable for its users
6. Invite community members to connect with each other

More specifically for the designed elements:

1. Design a system of accessible walkways between seating areas
2. Design seats for individual and collaborative group work
3. Design work surfaces compatible for performing professional tasks
4. Design a system to reduce sound reflection within the space
5. Design a sound absorption medium to limit distractions from urban noise
6. Design a system/product to protect users from weather changes

Methodology

Perspective shift techniques and concept mapping were used to iterate concepts and design conjectures for initial uses of the space. Items such as walkways, seating and working desks, methods of soundproofing and levels of weather management will all be considered in this process.

Mood boards and CMF boards based on current neighborhood architecture and historic visuals, as well as natural elements informed the aesthetic decisions used for sketching and modeling.

All concepts were explored through analog and digital sketching, as well as physical testing.

Strategic placing of designs were achieved through the use of 3D digital modeling to understand the scope and dimensions of the space. The use of the Ohio State Desis Lab Hyve (hybrid virtual environment technology) allowed the 3D digital models to be placed in the site to truly feel immersed in the design on the property.

Progress reports and meetings were scheduled with the NAHA to receive feedback on design conjectures and primary concepts in order to pursue further designs.

Features - *uses and functionality*

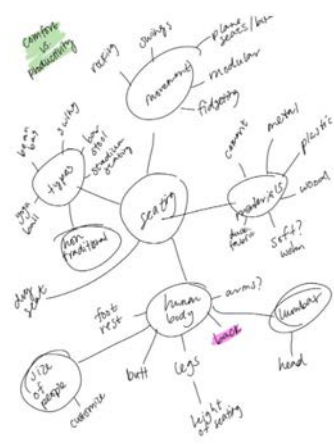
- Has designated spaces for work, both individual and collaborative users
- Space is ADA compliant, for all users to be able to access the space
- Year round, permanent installation; designed for longevity
- Utilizes entire plot of land purposefully; accessible from W Third Street to parking lot behind property
- Accommodates at least 30-40 people
- Each seating arrangement accommodates around 4 professionals at a time
- Capacity to host professional community events, held by NAHA

Attributes - properties of the space

- Reminiscent and honoring of Wright Brothers history
- Invites the existing community
- Upholds community values and local culture
- Spatial arrangements that foster sociable and tranquil sections for different users
- Low maintenance property landscapes/structures, requiring little upkeep by the NAHA
- Leaves a positive, lasting impact on the Wright-Dunbar community
- Space is clearly defined for professional working; not for recreational activities

DEVELOPMENT

MIND MAPPING



Civic world → activist, research lab, non-profit
- accessibility
- equity

- right handed + left handed
- ADA compliance, turn radius
- wheel chair accessible seating + table height
- modularity for inclusivity
- encourage conversation
- embracing social distance → individual seating
- alarm system
- recycled materials
- comfortable
- improve mental health
- embracing nature
- solar panels
- opportunity for technology

Domestic world → mature design firm
- expertise
- tradition
- norm
- conservative

- bolted down, concrete, metal, not steals
- accessible to everyone
- stout basic shapes
- table chair combo (not uncomfy)
- don't leave patterns
- doesn't pool water
- dirt control
- standard groupsize vs. individual
- ergonomic seating + work surface
- outlets
- Signage → know what site is for, has wifi

World of inspiration → artist
- grace
- intrigue of society

- wright brothers themed
  - planes → props, wings
  - bicycles → gears, spokes → types of seating
  - mobility
- painting onto the site
- stretch what eased is
- solar panels
- different heights of tables
- heights of walkways
- GEARS, industrial look → wheels, castors
- comfy seating, fun for adults

To begin the ideation process,we used concept mapping and another technique called perspective shift to get into the mindset of the user and features that are needed for a successful work space.

industrial world → large industrial group
- efficiency
- productivity
- standard

- materials → metals, concrete, plastic
- cost
- easily replaceable + fixable
- cleanable
- comfortable
- durable → longevity
- sustainable

DEVELOPMENT

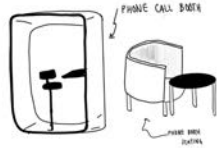
INITIAL ITERATION

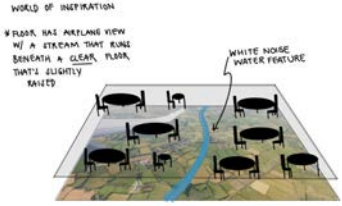
Idea mapping led into a rapid iteration phase where walkways and seating arrangements, outdoor tables, and both benches and individual seating were quickly sketched.

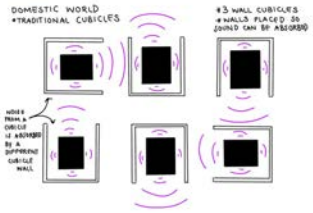
DEVELOPMENT

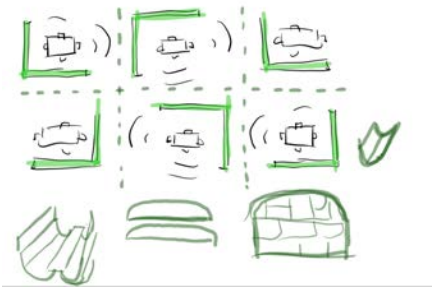
INITIAL ITERATION

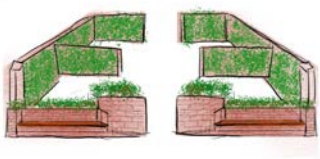
The early ideation phase for sound management includes perspective shift scenarios, the exploration of hub-like individual areas, white noise, and natural elements.

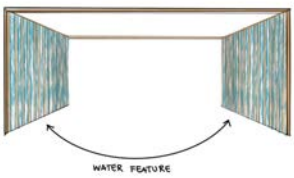


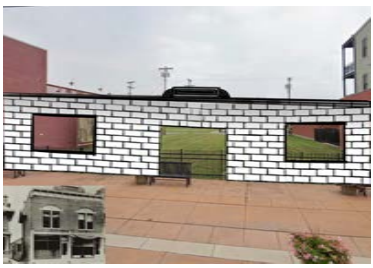


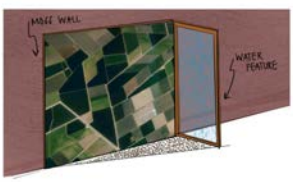


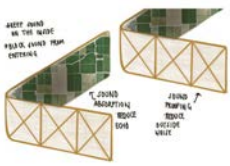


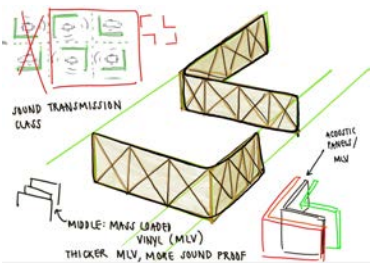


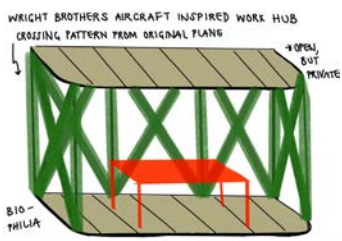


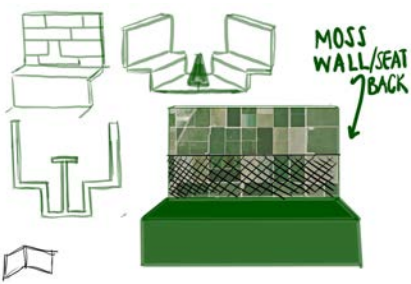


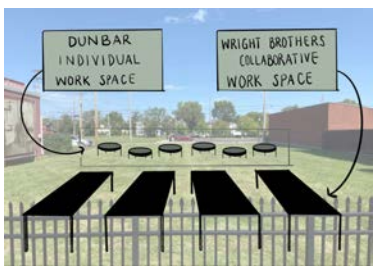






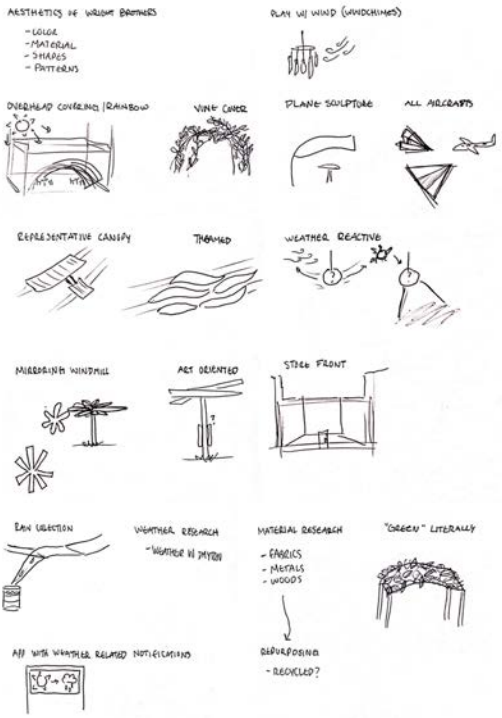


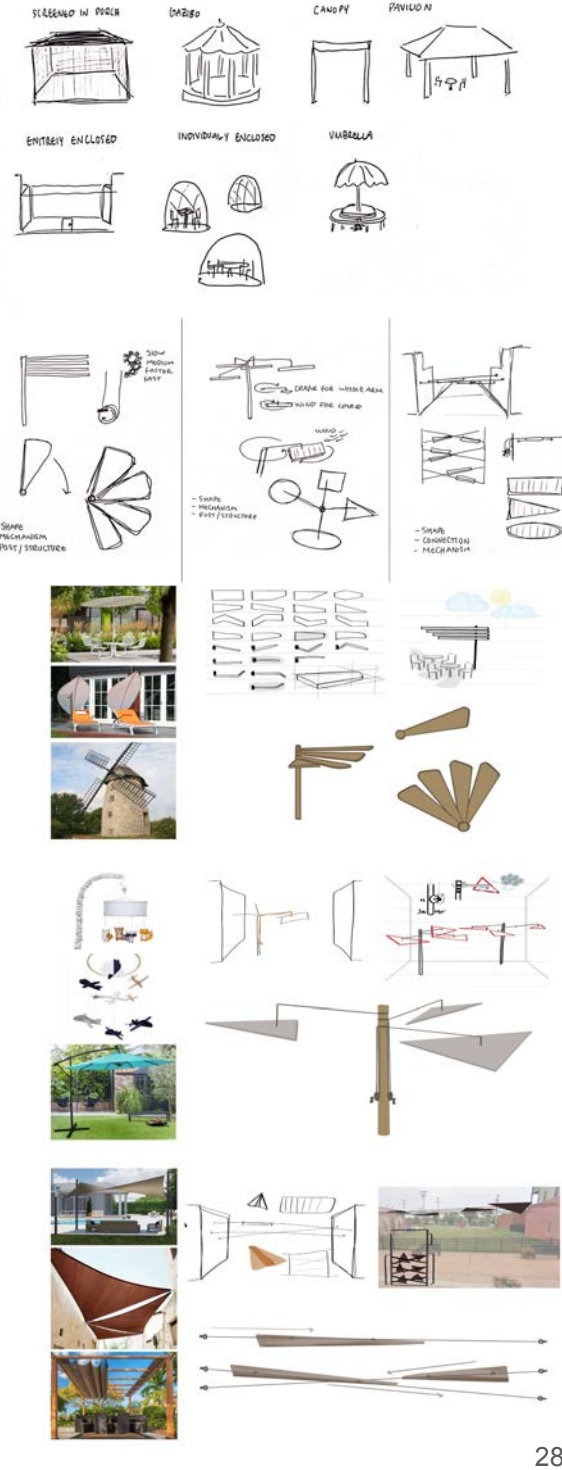




DEVELOPMENT

INITIAL ITERATION

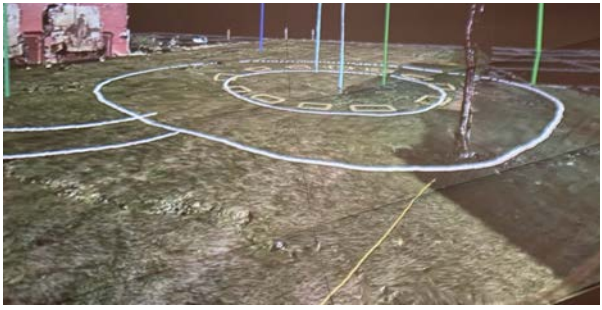


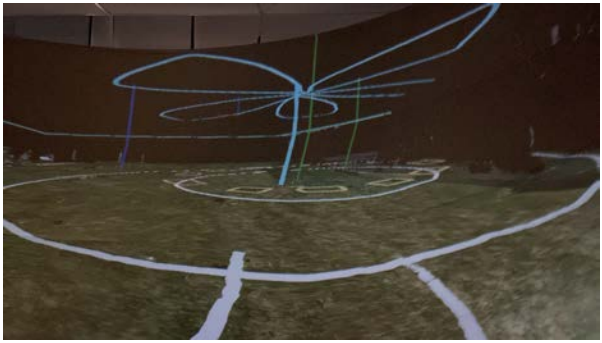


The perspective shift or “six worlds” ideation technique helped find a ideas that already exist and ones that could exist. Mix and matching ideas from these six worlds created ones that may not have been thought of before.

Three concepts for weather management were pulled. Each one solved the problem in a unique way while connecting back to the original Wright Flyer.

3D ITERATION

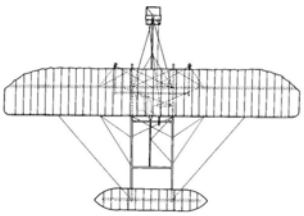


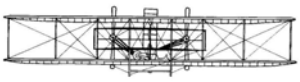


The HYVE 3D or hybrid virtual environment program was used to draw on a 3D scan of the design site. This allowed us to map out walkways in the appropriate scale where I learned that the front fence of the site was acting as a barrier to the rest of the lot.

Initial weather management concepts were also explored to understand height and scale in 3D versus simply on pictures of the site.

MOOD BOARD



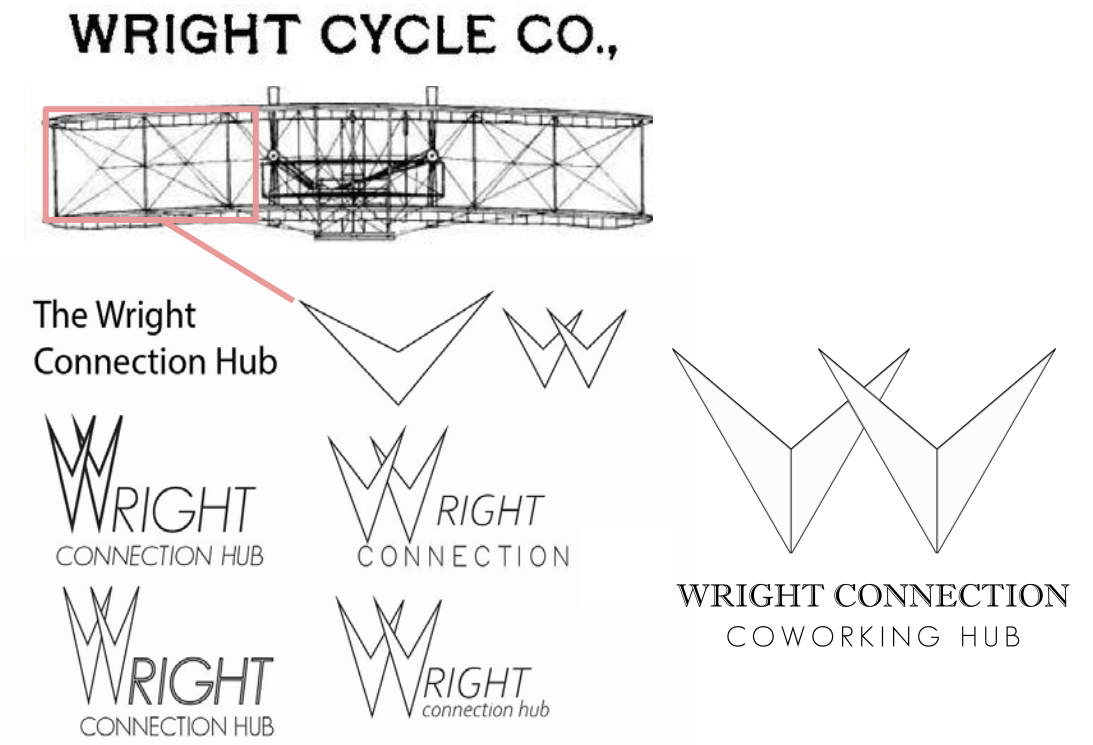


A CMF (color, material, finish) and mood board was developed to give the design concepts a sense of form and direction. This meant capturing the spirit of the city and street, as well as acknowledging the designs of the Wright bicycles and planes.

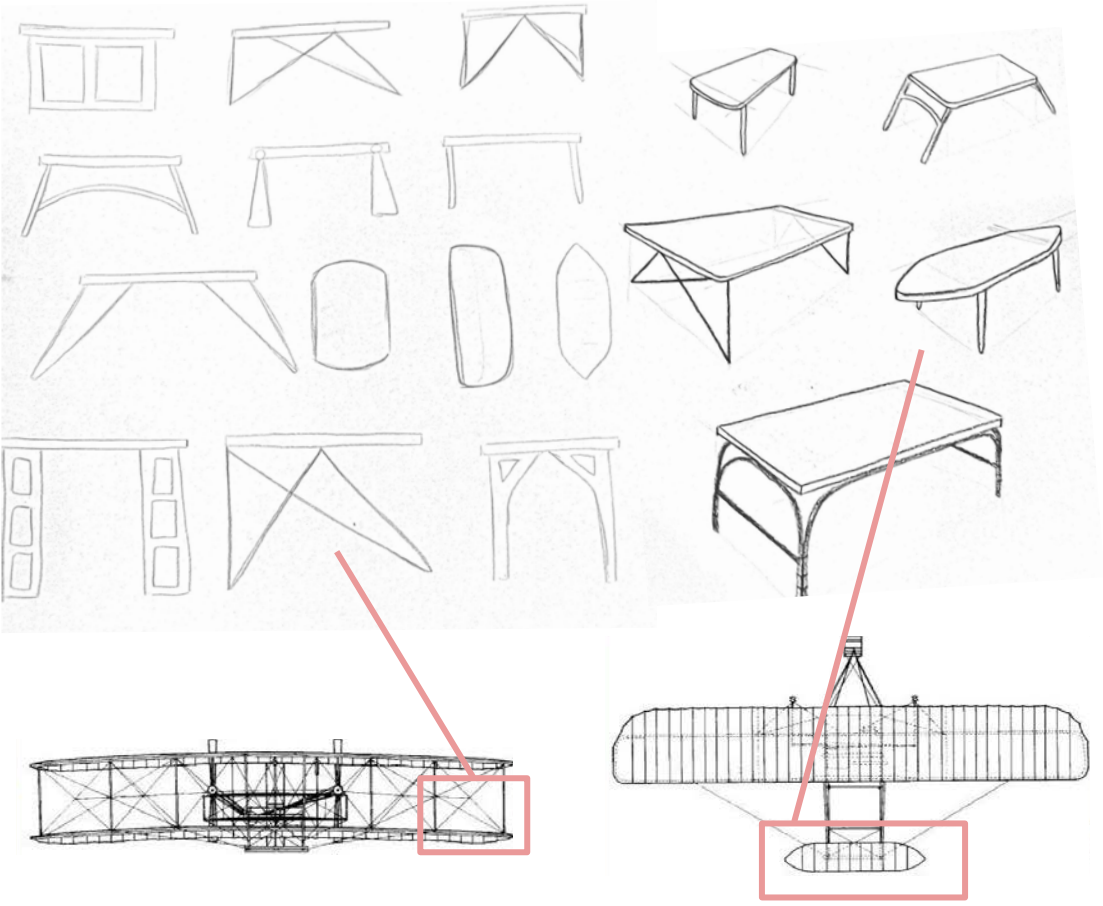
BRAND DEVELOPMENT

Developing a name for the site along with a brandable logo was important for this seat to be able to leave an impact. The final chosen logo of the W is derived from Wright plane engineering, but symbolizes users joining together, like two planes.

The Wright Flyer Coworking Space
The Innovation Station
The Wright Place to Work
The Wright Connection Site
The Wright Connection Space
The Wright Connection Station
The Wright Connection Hub
The Wright Connection Coworking Space
Wright Connection Coworking Hub

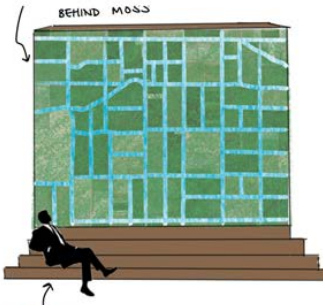


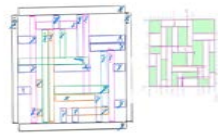
FURTHER DEVELOPMENT

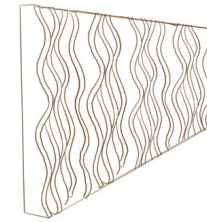


The design of the mood board and brand allowed the work surface concept to have a much clearer direction, where the form was derived from plane shapes without being extremely literal.

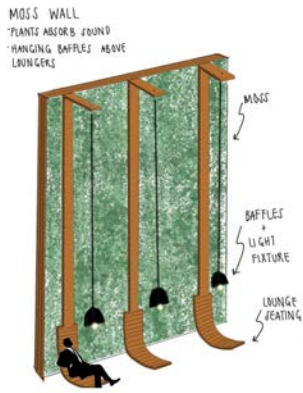
FURTHER DEVELOPMENT

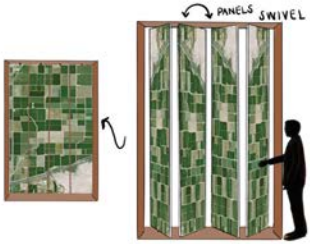


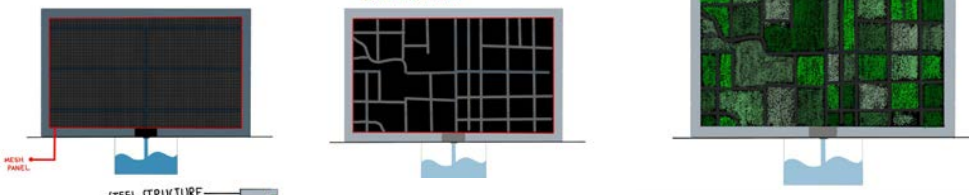


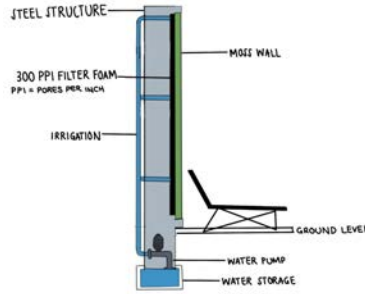


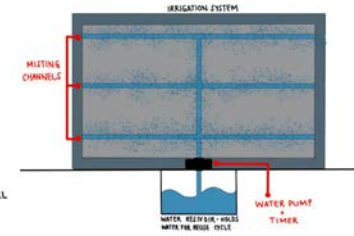
Form Iteration











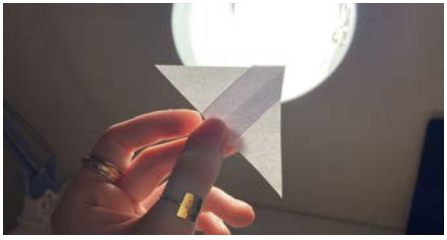
The main developments during this phase was the defining the aerial view aesthetic as well as the exploration of attached seating to anchor the wall in the space. White noise and the aspect of interaction were also being considered at this time, and dimensions had not yet been clearly defined.

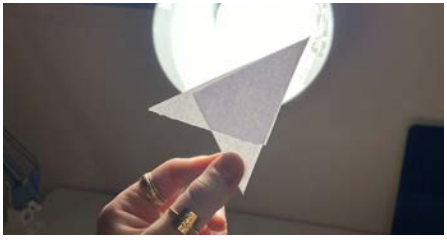
Additionally, since the scope for managing sound became focused on a living moss wall, an irrigation system was also explored.

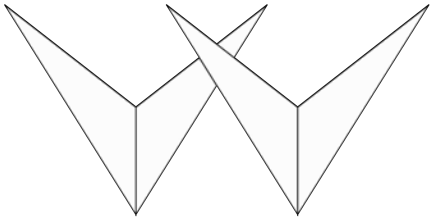
DEVELOPMENT

Pulling ideas from the mood board and thinking of objects that fly, form development was the next step for what would sit in the sky. By folding paper planes, patterns were found as well as how light reacted to the layered sections. These shapes and structures also followed those of the logo.

FURTHER DEVELOPMENT







DEVELOPMENT

EVALUATIVE RESEARCH: SPACE

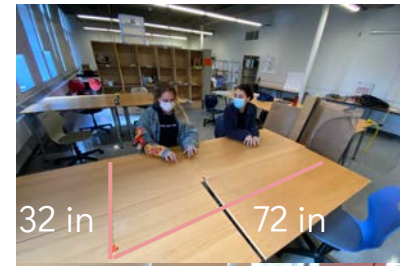
Evaluative research was used to conduct small scale experiments, testing concepts from our initial design concepts.

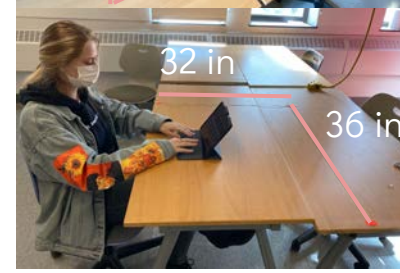
Question
Is the designed walkway conducive to users easily maneuvering through the space and finding opportunity to collaborate?

Method
This goal will be validated through a visual analysis of physical activity within a given space. This will allow design walkway elements to be revised and updated for better success implementing the pieces into the space based installation.

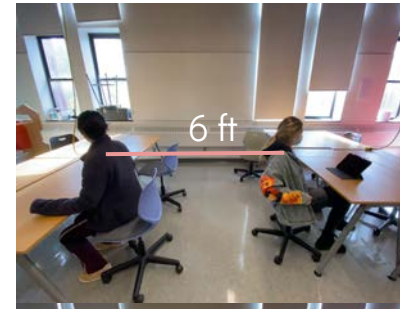
This goal will be tested by setting up a space the same size and style as the designed co-working walkways and allowing participants to explain any pain points they feel are apparent while moving throughout the space. They will also indicate whether the way they navigate the space encourages them to sit with someone they do not know or collaborate with someone new.

Participants will range within different areas of design, as well as non-designers, including those who do not know one another. This will allow me to understand the relationship between users who are using the space as a way to introduce themselves to someone new.





Results
After running an activity with four participants, one from Dayton and another who did not know other participants, we learned that this space is plenty big as a working space. The size of the work surfaces and walkways are sufficient for working and walking with others, with room to spare. The walkway no longer needs to accomodate a sound design moving forward. In terms of encouraging collaboration, participants said that they would sit catacorner with someone they do not know at a table, but might not collaborate immediately.



Design Conclusion
I cannot force users of the space to collaborate, but I certainly can nudge them; moving forward, I want to look into finding ways to nudge users into starting conversations with other users. This can be ideated on walkway surfaces as well as table top surfaces, incorporating collaborative themes like elements from the Wright brothers' workshop. But, the current design lends itself to invite users to sit spaciously with others.

DEVELOPMENT

Question
Is the design of the table and chairs successfully received as reminiscent of the Wright brothers?

Method
This goal will be validated by receiving critical verbal feedback about aspects of concepts that make the overall design strong or weak.

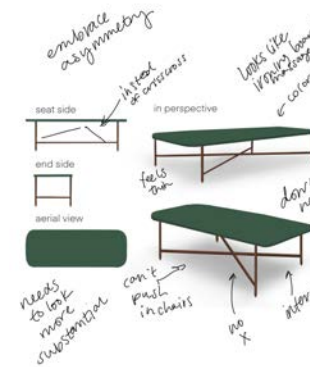
This evaluation process will be done by iterating several ideas for the work surface and seating, ending up with several strong concepts. The concepts will then be reviewed by peers alongside a mood board that reflects the Dayton area and Wright brother era and innovation. The participants will then discuss elements that they like or find reminiscent of the intended mood board; this will inform a more final design concept that strongly holds the visual identity of the Dayton and Wright-Dunbar community, in order to ensure that it is successfully received.

Participants will range within different areas of design, as well as non-designers, including those from Dayton as well. This will ensure that users who are not familiar with Dayton, but familiar with the Wright brothers will have a solid grasp of the space, just as much as those who are local to the space.

Results
During the activity, I displayed my mood board and concepts to eight designers and three non-designers, noting their observations and comments. There was a general agreement that while all designs were reminiscent, the first two had the strongest visuals and connection back to the desired mood. These designs were in fact more literal shapes and materials from early Wright brother planes. This proved that the "vintage" look of the plane can also go hand in hand with the innovative modernity that the Wright brothers pioneered.

Design Conclusion
For a space based design, it's important to keep in mind that the community specifically wants to honor the site and keep it "on theme" with it's history. I think incorporating shapes from the plane wing that look modern are a good way to pay homage to the Wright Flyer design while also embracing a modern approach that is still cohesive with the space. Overall, the materials should still reflect the Wright brothers and current buildings on the street. A combination of the first two designs shown will be pursued.

EVALUATIVE RESEARCH: AESTHETICS



EVALUATIVE RESEARCH: SOUND MANAGEMENT MEDIUM

Question
What type of moss is most suitable for sound management?

Method

Sound Absorption | Test 1

1. Rubber band is placed around cup and plucked to produce noise
2. Noise of rubber band is recorded from a decibel measuring app
3. Moss is added inside the cup
4. Rubber band is plucked again and the sound decibels are measured
5. Continue adding moss
6. Record decibels of rubber band being plucked

Sound Absorption | Test 2

1. Play white noise at 250 HZ
2. Place phone with decibel measuring app inside a pot
3. White noise gets played outside the pot
4. Phone app measures the sound sound decibels coming from outside the pot
5. Moss is added inside the pot and decicles are measured
6. Moss is added on top of the white noise source and decibels are measured

Sound Absorption | Test 3

1. White noise generator app plays noise at 150 HZ from inside a box
2. Measure the sound using a decibel reader app from outside the box
3. Add moss inside the box where the noise source plays 150 HZ white noise
4. Measure the sound using a decibel reader from outside the box

EVALUATIVE RESEARCH: SOUND MANAGEMENT MEDIUM CONT.

Results

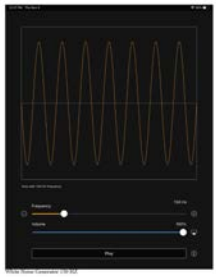
Test 1: While there were slight differences in the decibel readings when moss was added to the cup,there was no way to measure how hard the rubberband was being plucked during the test. Thistest informed the need for more quantifiable information surrounding sound absorption.

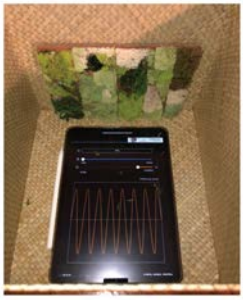
Test 2: Test resulted in insignificant readings, potentially due to the preserved moss not being dense enough to properly dampen noise. This finding helped form the decision to create a living moss wall for the added density.

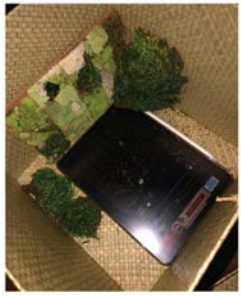
Test 3: The methods used to measure sound absorption at this phase once again did not provide the insights I was expecting. The moss used during all three tests is preserved, therefore lacking the density living moss would have. The main takeaway from these experiments is that living moss needs to be tested because preserved moss does not properly absorb sound. Foam, cardboard, and glue were synthetic materials used during this phase and did not contribute to sound absorption, therefore materials with higher acoustic management properties will be.

Design Conclusion

Testing preserved moss did not yield the expected results, therefore living moss will be used in the final concept so the added density of a living organism can contribute to sound absorption.







EVALUATIVE RESEARCH: WHITE NOISE

Question
Is white noise an efficient method for managing sound?

Method
The identification of white noise as a way to promote productivity was explored through verbal feedback from individuals who consciously prefer working with ambient sounds playing in their background.

In begin the formative assessment, looking into popular methods of white noise provided information on products and technology available on the market.

To gain primary insight, individuals were first asked if they prefer to listen to white noise while working. If the answer was yes they were asked how they listen to white noise (machine, app, etc.) and if they have a particular sound they gravitate toward.

The specific questions that were asked during this process were as follows:

1.Urban landscape noise | Is this noise distracting?
2.Urban landscape noise masked by white noise | Does the white noise limit distraction?
3.Do you listen to white noise when working?

Results

During this research activity, it was found that many participants did enjoy listening to white noise, however of the individuals who listen to white noise it was noted that they have particular sounds that they like.
Most participants noted that white noise did help to limit distractions from sounds of traffic and other sounds from urban environments. While most participants do not generally use white noise, the participant that noted they sometimes listen to white noise and the participant that frequently listens to white noise both stated that they rely on personal devices to generate white noise. Various apps and sound machines exist to provide white noise, and the ability to play specified sounds based on preference is preferred. Both participants said they use apps to play sounds they have become partial to, and noted that hearing white noise that is different from what they typically play can be a distraction.

Design Conclusion
If individuals wish to have white noise playing to improve focus, they will use headphones and play the sounds they have been accustomed to.

1. Urban landscape noise | Is this noise distracting?
2. Urban landscape noise masked by white noise | Does the white noise limit distraction?
3. Do you listen to white noise when working?

	Question 1	Question 2	Question 3
Participant 1	Yes	No	No
Participant 2	Kind of	Yes	No
Participant 3	Yes	Yes	No
Participant 4	Yes	Yes	Sometimes
Participant 5	Yes	Yes	No
Participant 6	Yes	Yes	Yes

DEVELOPMENT

EVALUATIVE RESEARCH: MATERIALS TESTING

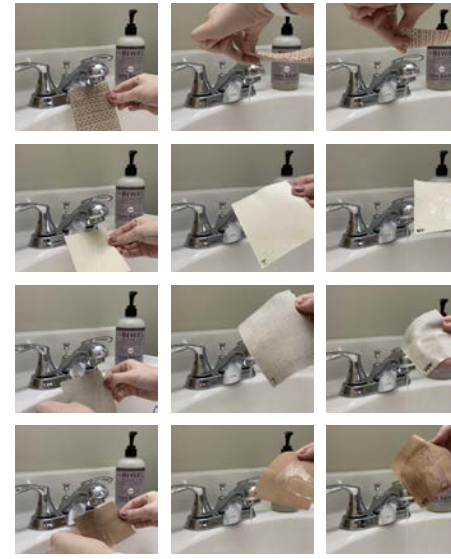
Question
What materials can be used that are used should feel light and airy, as though they could fly? How can those materials be treated for weather-resistance?

Method
The goal will be found by purchasing a variety of materials and testing them. Both treated and non-treated materials will need to be tested to find the best solution.

The process will start cutting two small pieces of a variety of fabrics. These include cotton, polyester, canvas, and recycled pvc. Half of the pieces will be treated with a uv protector, sun-blocking spray as well as a waterproofing, fabric protector. After letting the treated fabrics sit for the required amount of time, both sets of fabrics will be tested with water to see how well they repel it. It will be a bonus if they can be set outside to see how well the sunblock spray protects the fabrics from uv light. Knowing that this is a short period of time for testing, the latter is not possible for longterm.

Results
While testing, most of the treated materials repelled water very well. Both the treated and untreated cotton pieces did not repel the water well along with the untreated polyester and untreated canvas. The treated polyester and treated canvas repelled water very well. The pvc plastic sections had holes in them, so the water fell through the material, rather than rolling off the side. Fortunately though, the untreated pvc plastic and treated pvc plastic did not let the water soak the material.

Design Conclusion
The final materials that were chosen for the shade project were ones that best represented the aesthetics of the Wright Flyer. Each fabric that was tested had similar qualities, except for the pvc plastic. The pvc plastic would only solve for one of the two problems that needed solving for weather; sunlight not rain. The material also needed to feel light and airy, so that it could feel as if it was flying, rather than a material that felt heavy and stationary.



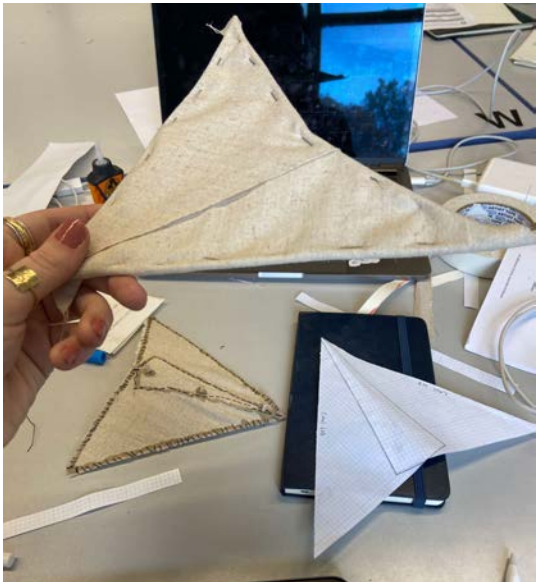
PROTOTYPING

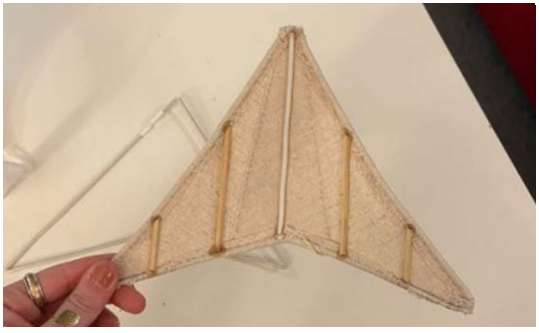
The table design, preserved moss walls and shade design were all built at small scales to learn about the properties of our designs.

We thought about different methods of construction and how these designs would be built in real life at full scale. It was also important to see the three concepts placed with one another to see if they were cohesive and be able to make appropriate changes from there.

DEVELOPMENT

PROTOTYPING





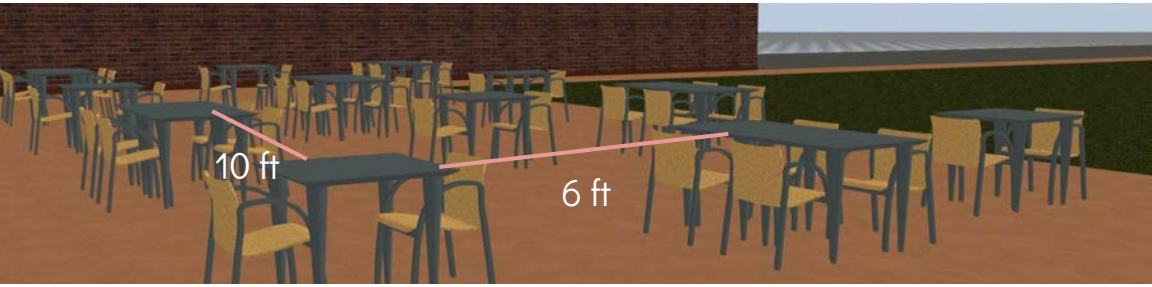
PRIMARY FURNITURE CONCEPTS

The primary work surface and seating concept consists of a four person table outfitted with hooks and with the opportunity for a place to host an electrical box.

The seating design is a bench, aesthetically informed by the table legs and has a sleek spot at the back of the seat for water drainage for when it rains.

The material choices at this point was some light wood and steel frame to ensure a structurally sound design.

PRIMARY SPACE CONCEPT



The initial walkway design eliminates the front gate, extending the existing tile from W Third Street into the space. The coworking space takes up only the front fifth of the site, but has access to the back parking lot.

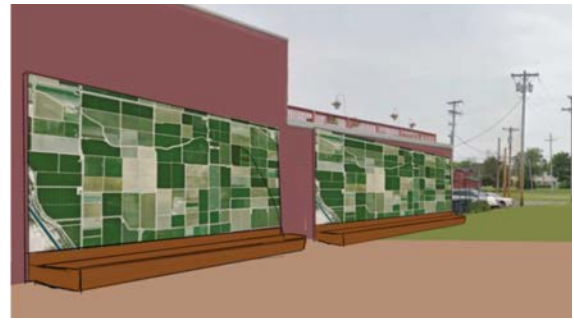
DEVELOPMENT

PRIMARY SOUND CONCEPT

At this phase the dimensions had not been finalized and the structure was intended as one piece that would expand across the majority of the brick walls surrounding the work area.

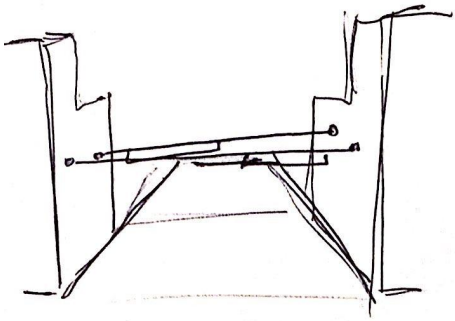
The main focus was emulating the birds eye view aesthetic while anchoring the wall within the space by implementing a seating component.

The seating was intended to serve as loungers for individuals who needed to read or work individually.



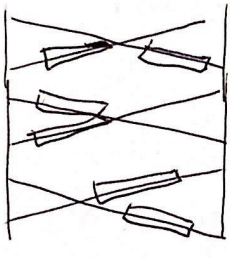
DEVELOPMENT

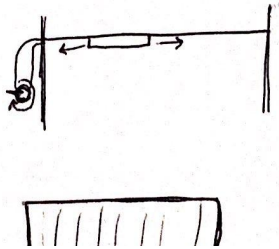
PRIMARY WEATHER CONCEPT

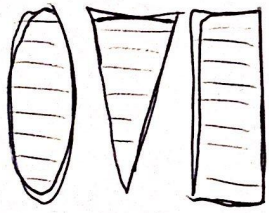


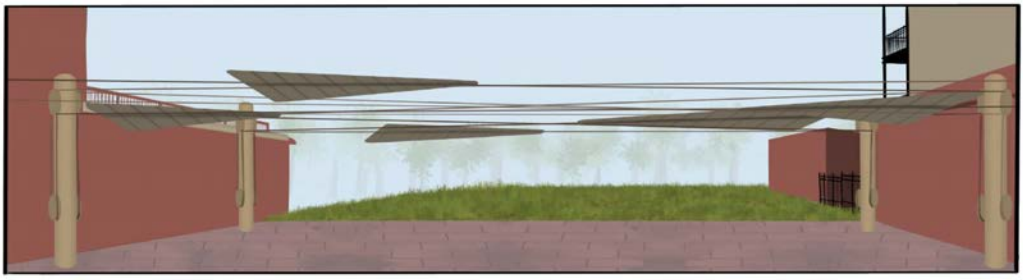
The primary concept was to create shades that would span the co-working space. Each wire would have a few shades on them, allowing for the maximum of tables to be protected from the sun or rain.

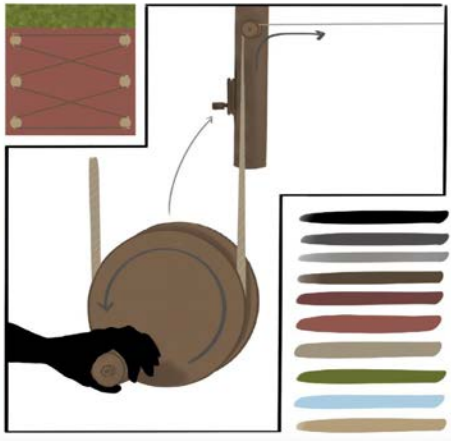
Attached to a crank mechanism, the shades could be individually moved to each table.

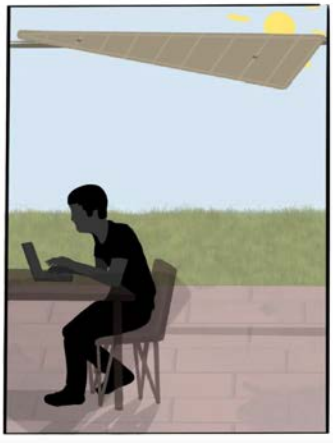












FEEDBACK

After receiving feedback on these initial concepts from both peers, instructors and our project partner at the National Aviation Heritage Area, all designed aspects were on the right track but needed some nudging forward.

walkways

walkway should acknowledge footprint of Wright Brothers' property and feel less static

sound design

acoustic panels take up lots of wall space, therefore making smaller panels that can be repeated provides flexibility

work surface

expand typology of work surface options and make table legs more like aviation features

weather design

materials that are used should feel light and airy, as though they could fly

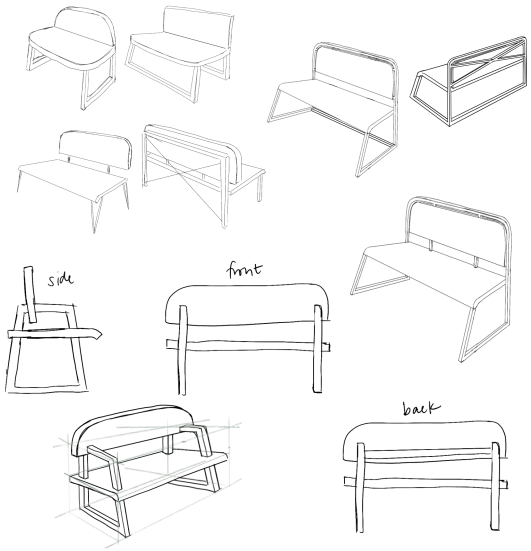
seating

seating doesn't need to be matchy with table and find ways to make seating appear "floating"

DEVELOPMENT

REFINEMENT

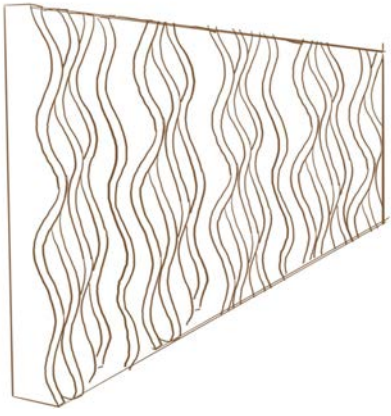
Concepts were refined through sketching and making prototypes of the seating, and also exploring ways to incorporate the cycle shop footprint. A weightless seat meant finding ways to make the wooden bench float with legs that didn't compete aesthetically with the table.



This concept featured organic, wavy lines that repeat throughout the structure. The initial dimensions for the walls were 12 feet tall and 48 feet long to stretch across the majority of the brick wall framing the work space.

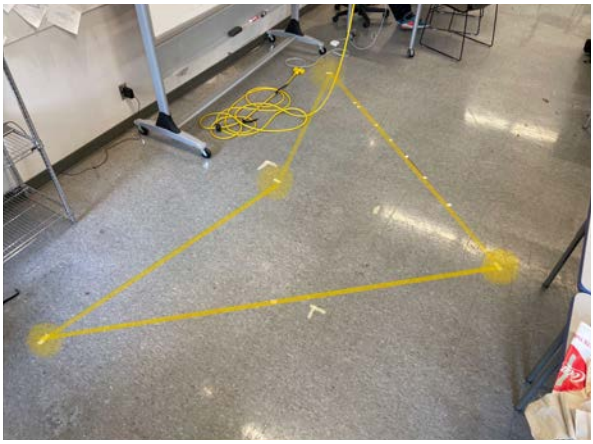
To be mindful of the artist studio, and to allow them to utilize their wall how they choose, the dimensions will be rethought so that that wall does not have to cover the entire expanse of the western wall.

Additional feedback was that the repeating waves were too visually busy, and could be refined to still emulate movement and topography without being distracting.

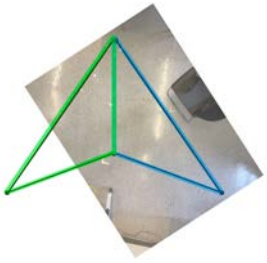


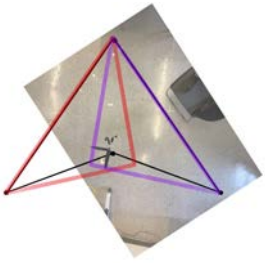
DEVELOPMENT

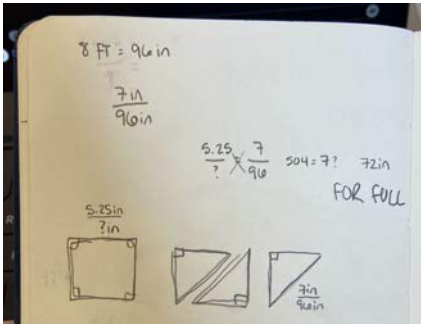
REFINEMENT

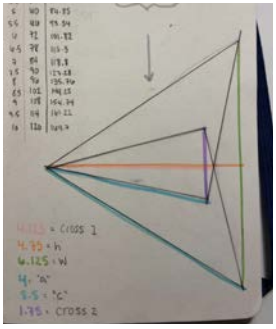


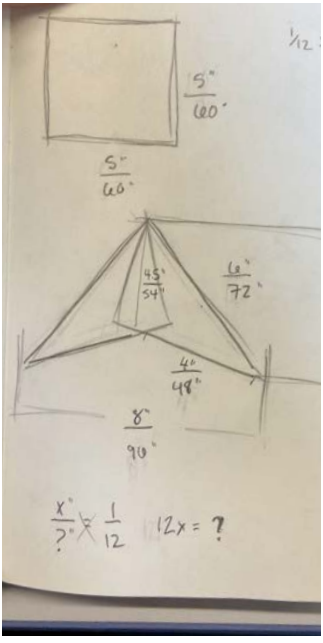
As the shade needed further development, tape was put on the ground to measure out what the shades area would actually cover. By sizing and measuring different sectional lengths, a final measurement of fabric was decided on.

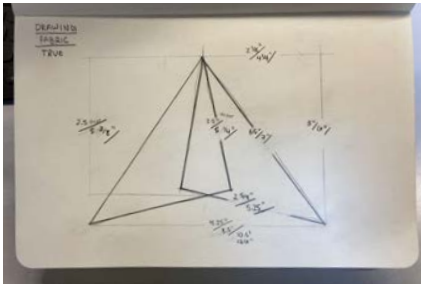


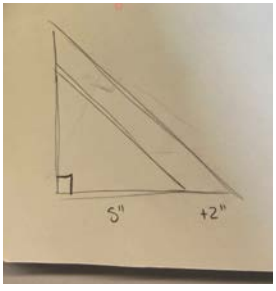




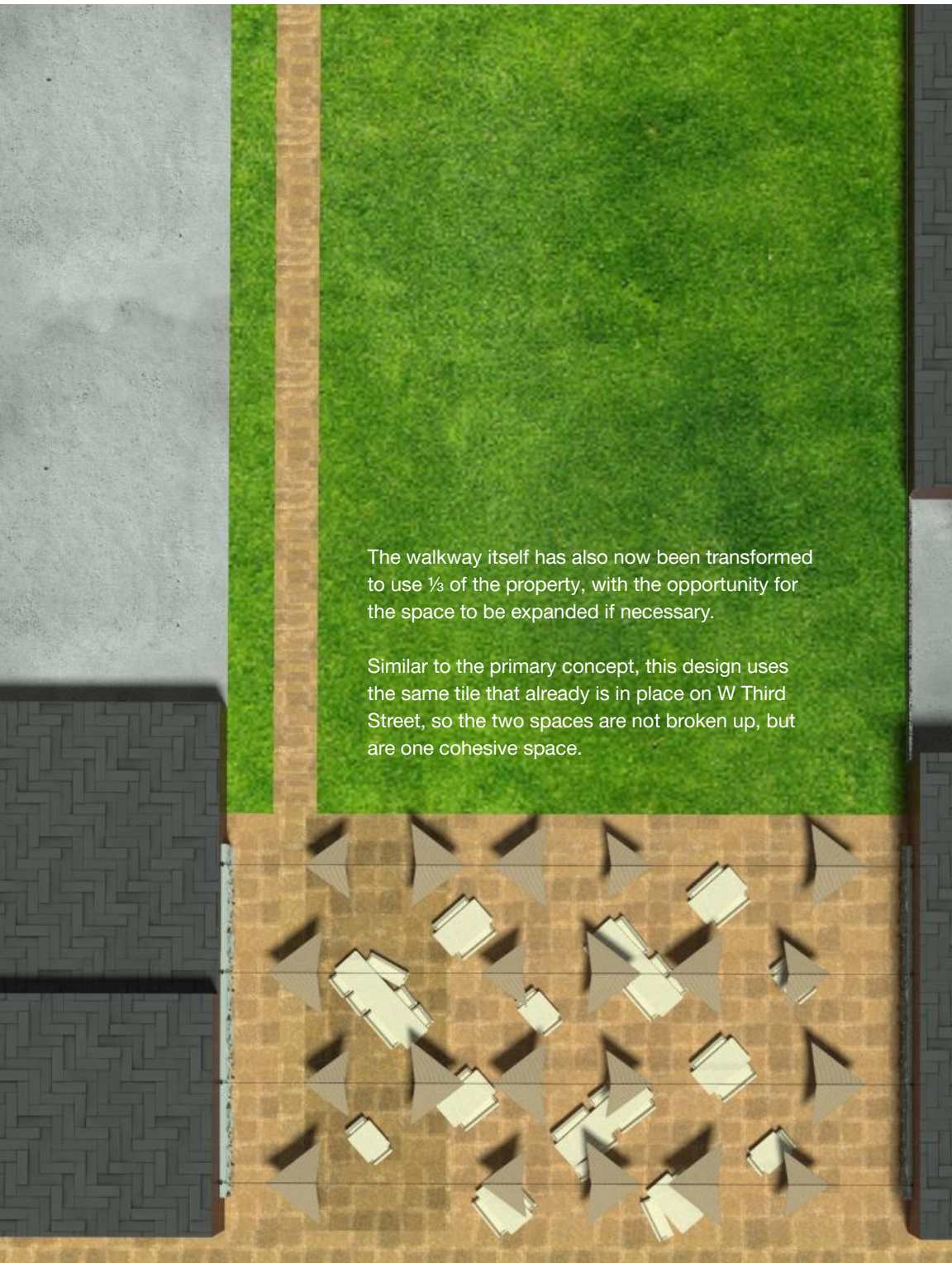






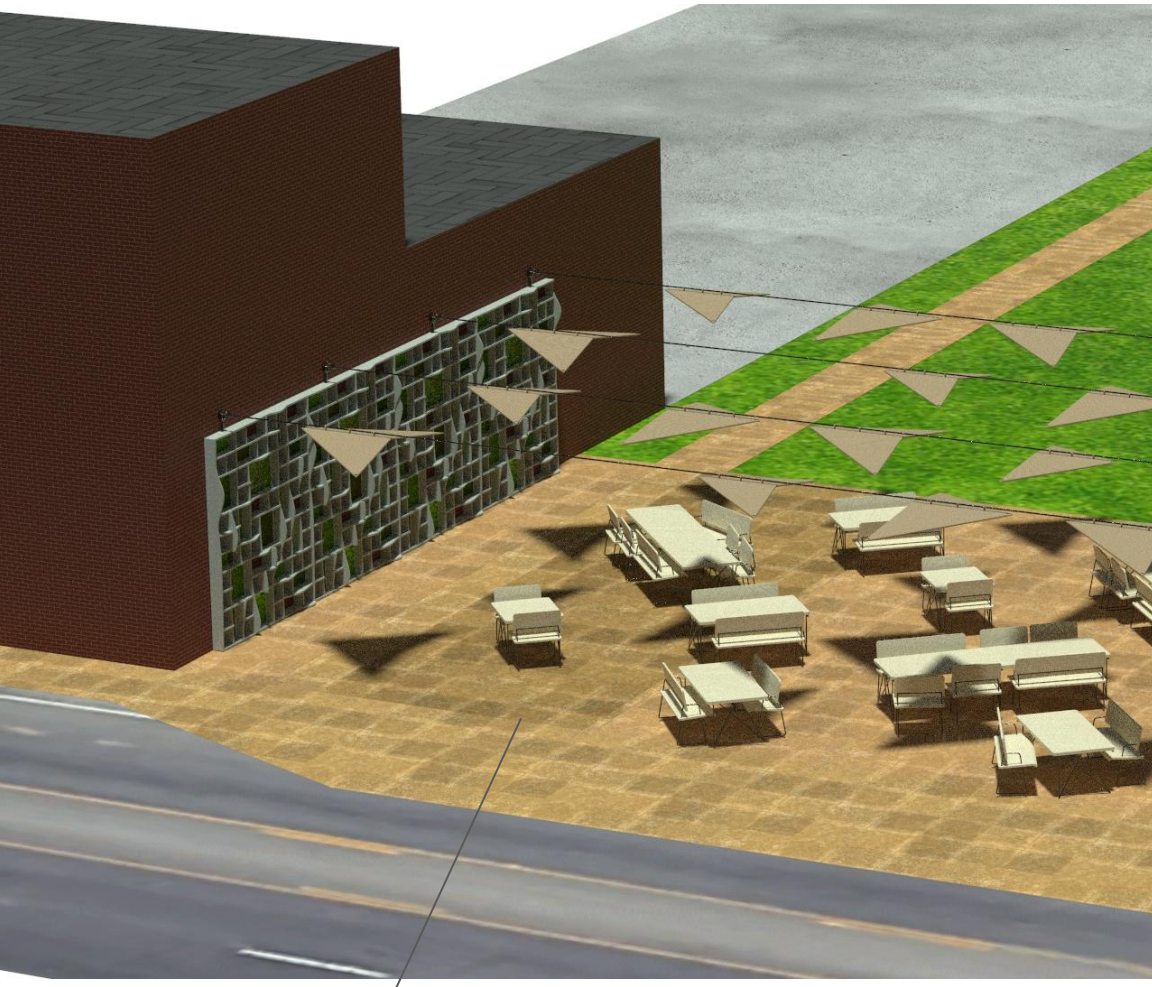


SOLUTION



The walkway itself has also now been transformed to use ⅓ of the property, with the opportunity for the space to be expanded if necessary.

Similar to the primary concept, this design uses the same tile that already is in place on W Third Street, so the two spaces are not broken up, but are one cohesive space.



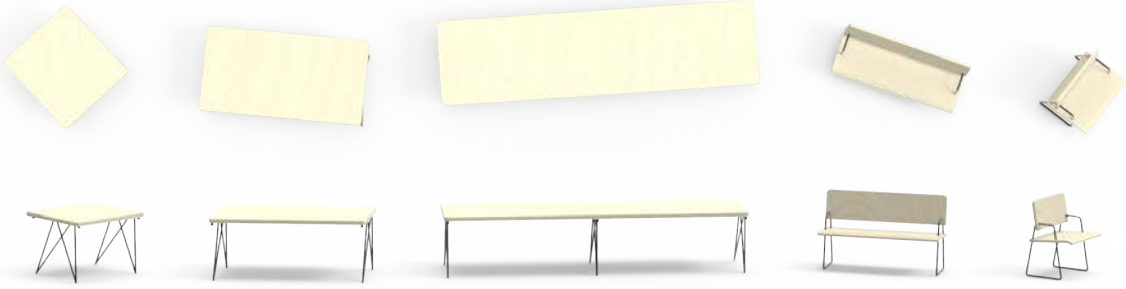
Based on surveyors maps of the property in the early 1900's and drawings from the Wright Brothers, the slightly darker tile indicates where the interior footprint of the cycle shop was, so the user can be "working in the shop". The seating direction has also changed to be more dynamic in the space.

The stone walkway allows the user into the space from the back of the lot to free parking, instead of walking through the grass.

FEATURES

With the opportunity to remove seats as necessary this site currently holds up to 56 users and is accessible to all of them. All furniture is designed for wheelchair users simply by moving seating out of the way. Free wifi will also be located in the neighboring building, accessible to all users. Trash cans are located along the street and restrooms can be found across the street at the National Aviation Historical Park.

The Wright Connection Coworking Hub offers the users three different sizes of tables and two different seating options for the different types of collaboration that occurs at the site.



SOLUTION

FEATURES

The final table top is built with resin finished ash wood, the same wood used in the Wright Flyer, to keep a smooth surface for writing as well as seal the wood from the elements.

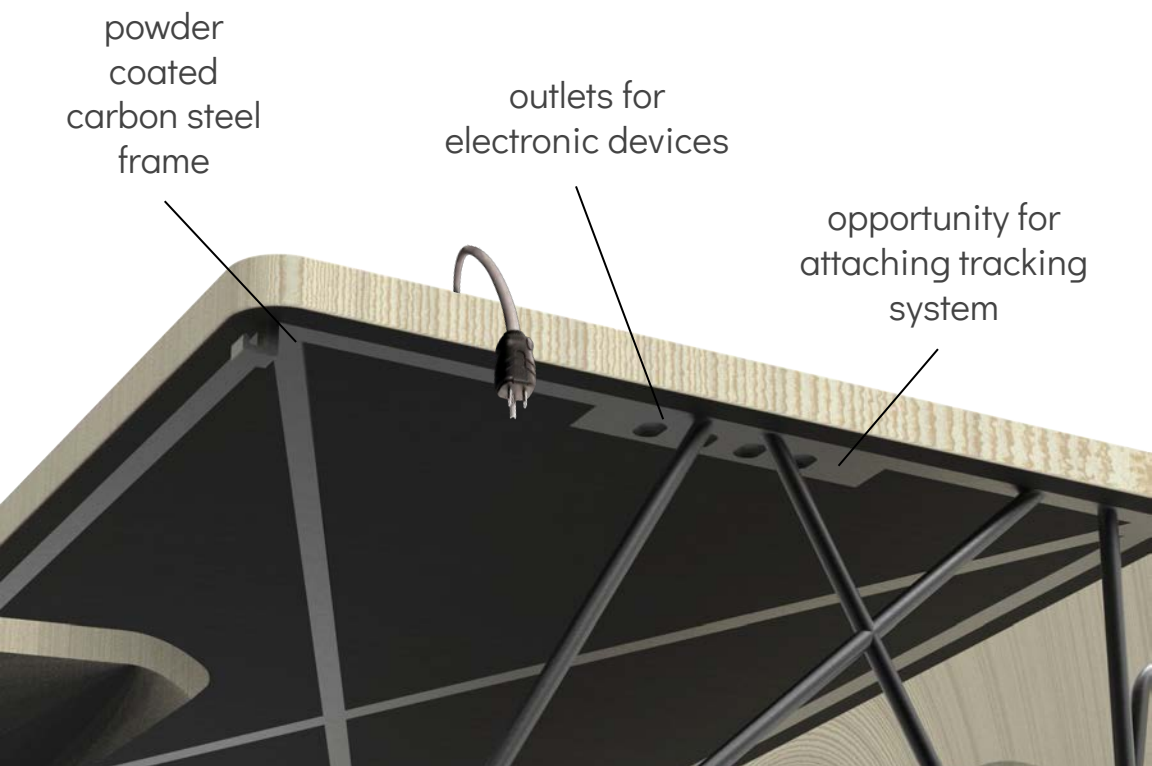
Hooks allow personal items to stay off the ground without compromising the side view of the table. The floating seats have also been modified to not need a back groove, but allow water to roll off the back.

SOLUTION

FEATURES

This final concept also is more technically sound, than the primary concept, with a powder coated carbon steel frame crossed underneath the wood. Four outlets on each side of the table allow all users to charge several devices at once and keeps rain out of direct sight lines.

The National Aviation Heritage Area also has the opportunity to attach a tracking device to these furniture pieces in order to locate them if property is stolen from the site.



SOLUTION

FEATURES

The final concept for the living moss wall includes cut out pieces to limit the amount of moss needed to create the visual impact of aerial views of farmland. The hollow recesses in the structure work to trap sound waves, preventing them from bouncing between the brick walls surrounding the space.

Various moss' will be used to include different shades of green, all of which have a Noise Reduction Coefficient (NRC) of 0.55-0.65. The ideal NRC is 0.75, therefore the moss combined with porous concrete and foam will provide effective sound absorption within the space.

The varying shapes emulate the grid like formation of farmland and the 10 ft x 12 ft structure can be repeated within the space as many times as the project client would like, allowing flexibility when it comes to the preferences of neighbors. The organic lines create the grid provide an element of movement and display topographical forms.

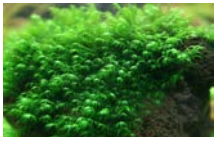
There are various types of moss that are low maintenance and grow well in the Ohio climate. The exploration of these mosses help to identify the types that would be the best for the outdoor installation.

Dicranum scoparium

Thuidium delicatulum

Vesicularia montagnei

Fissidens fontanus

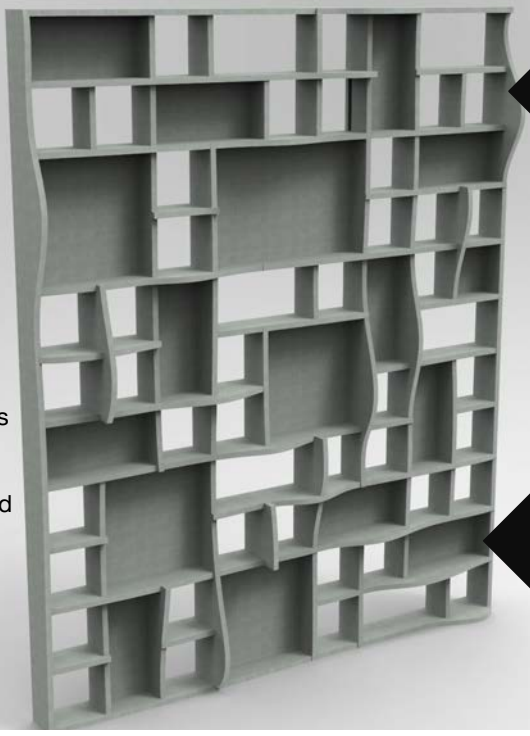


SOLUTION

FEATURES

10 ft x 12 ft

Revised dimensions allow the structure to be repeated within the space as many or as little times as project clients would like to be mindful of neighbors and cost.

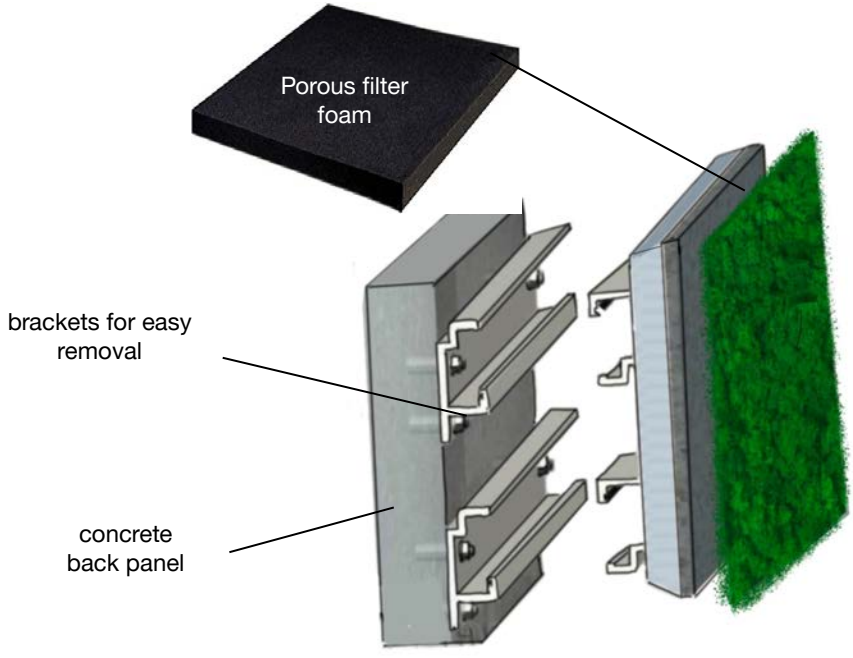


Porous concrete

perlite and slag aggregate

Hollow recesses

Trap sound waves and prevent reflection



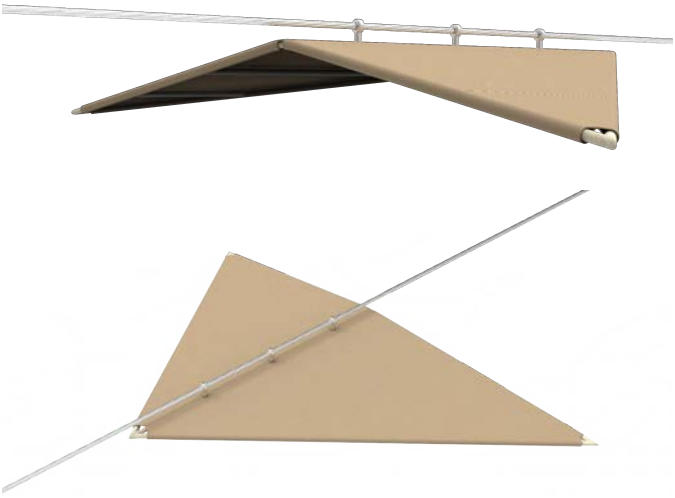
SOLUTION

FEATURES

The final shade is the same shape as the co-working space logo. Connected by eye hooks, the plane sits on a metal cable that spans the space. One each cable are multiple shade of different sizes facing different directions. This plays off of how different airplanes fly in the sky, all going in different directions.

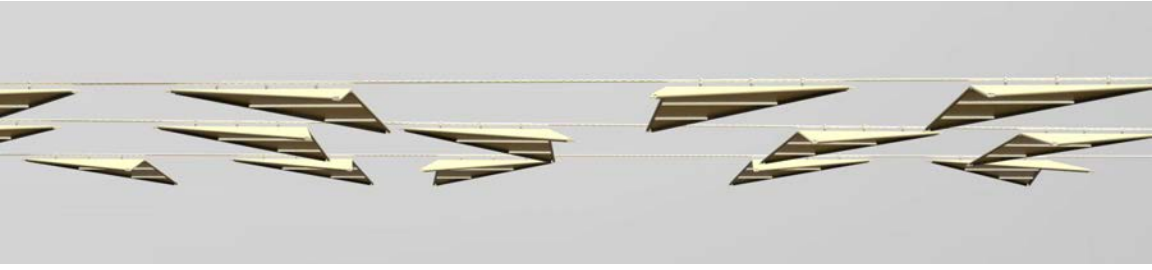
The materials are the same or similar as the original Wright Flyer. The frame of the shade is made of wooden dowels to keep the structure supported in shape. The fabric portion is awning fabric which is made for outdoor use. It is protected from UV as well as waterproof from rain. Because the fabric is made for outdoor use, it is made for longevity.

The end of the cable is connected to the top of the sound management wall. Screw eye hooks hold each cable in place strongly.



shades facing different directions

screw eye hooks that mount to the walls

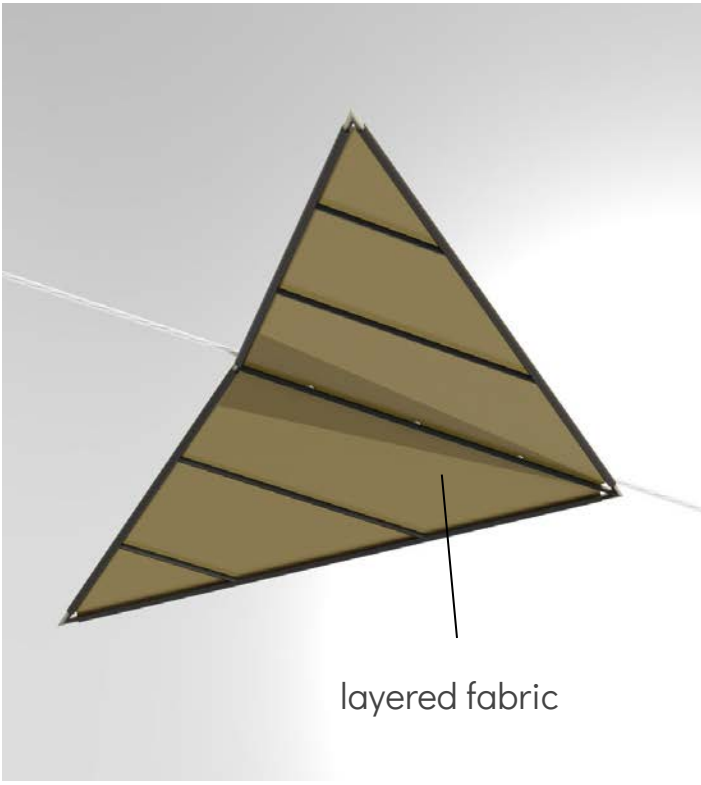


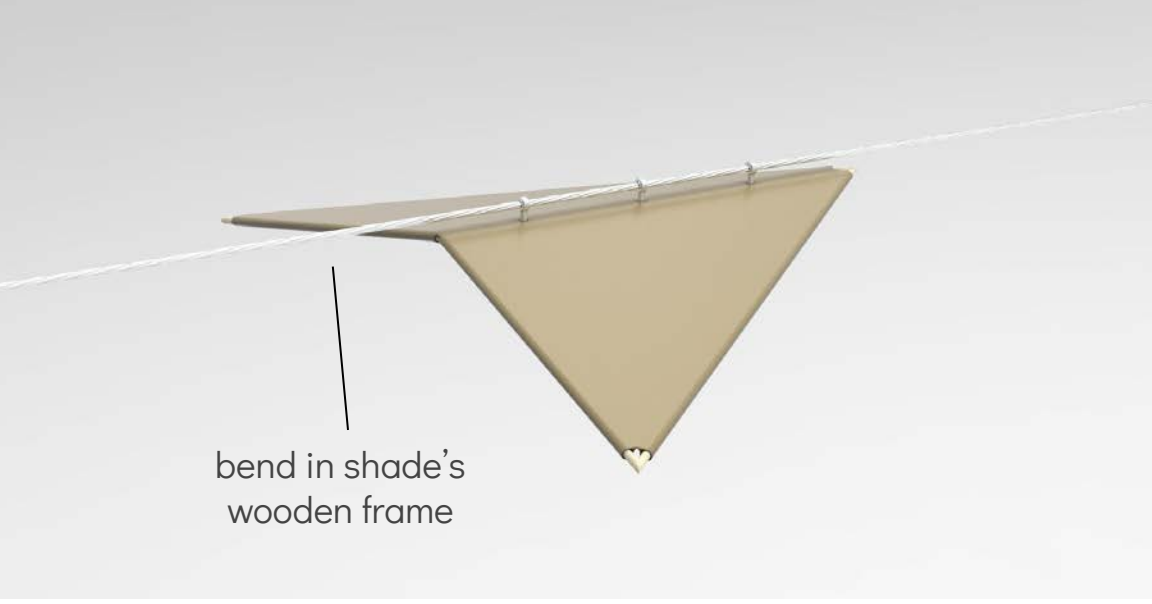
SOLUTION

FEATURES

The layered section of the fabric blocks the sunlight more, creating the “paper plane” look. This is a reference to things that can fly in the sky other than airplanes.

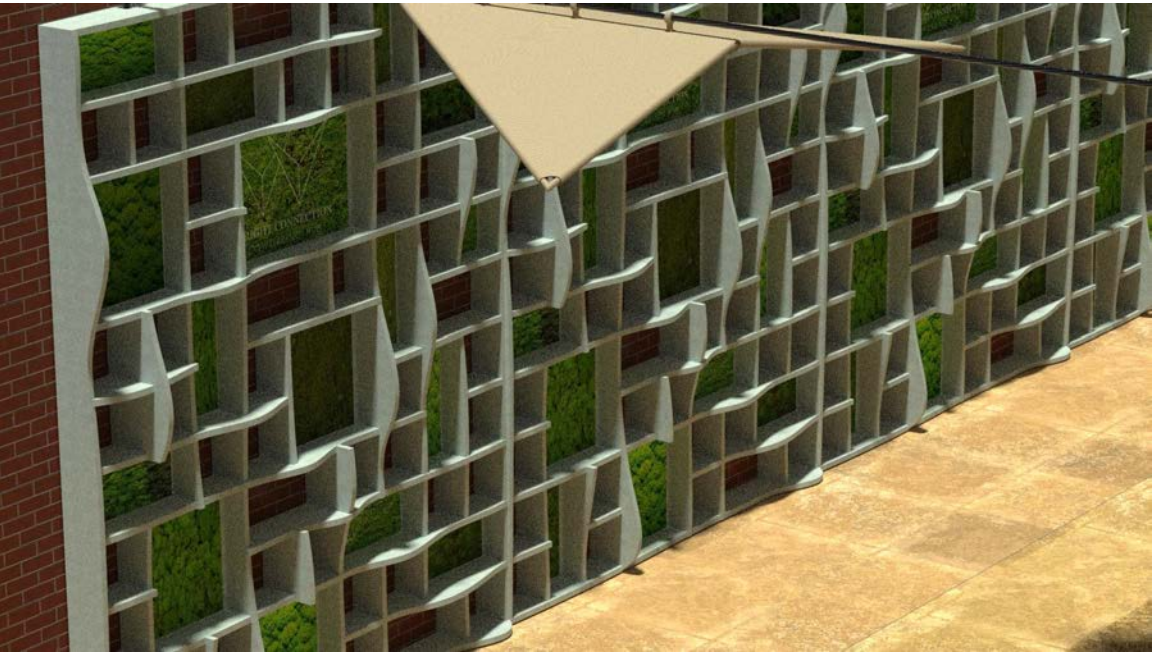
Each shade is bent slightly in the middle to help with the structure as well as the aesthetics. The bend helps keep the shade sitting the correct direction and not flipping over. While there is the concern of wind, using different awning fabric, like porus ones, can help.





HERO SHOTS

Renderings of solutions in space



Wright Connection logo able to be placed in moss panel

SCENARIO OF USE

In this user scenario, professionals can access the site from both the front and the back, with plenty of seating options to choose from; collaborating at large tables can encourage others to sit with them and join in on the innovative conversation, benefitting all users. Collaborating at the smaller tables can mean having more private meetings between professionals.

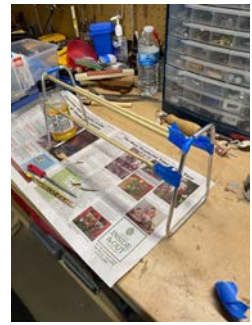
Sound from conversations between professionals, construction and cars is dampened by the moss wall in place.

SCENARIO OF USE

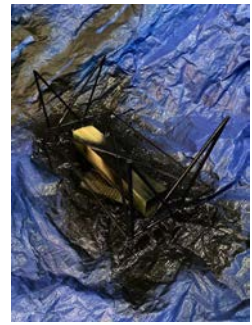
Hanging shades above professionals help manage sunlight for professionals below. As the sun moves throughout the day, different parts of the coworking hub are shaded.

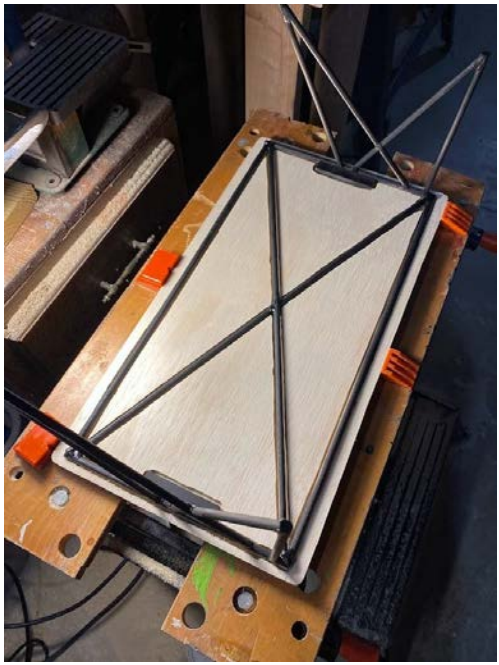
SCALE MODEL PROCESS











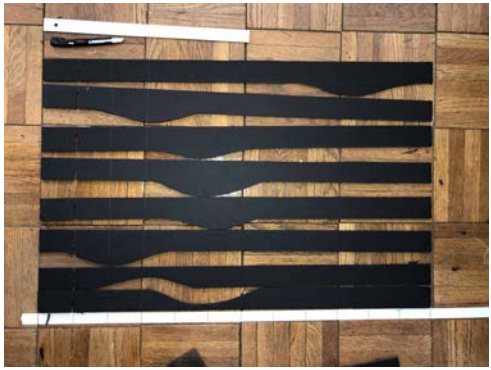
The process of building the table and bench meant trying out new techniques like aluminum welding and using a router. Through the process of trial and error of welding, the model ended up being made of wood, with the appearance that the table legs were metal.

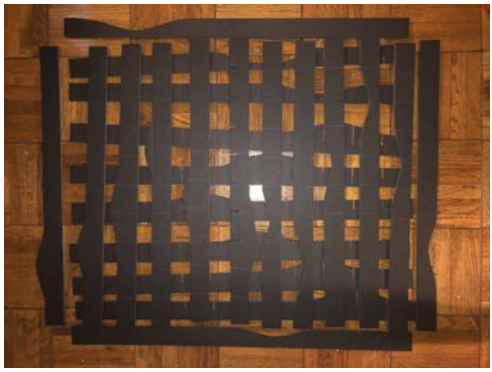
Other materials such as epoxy, polyurethane, wood glue and spray paint were used in the process of building.

SCALE MODEL

Final four person table and two person bench at ¼ scale.

SCALE MODEL PROCESS



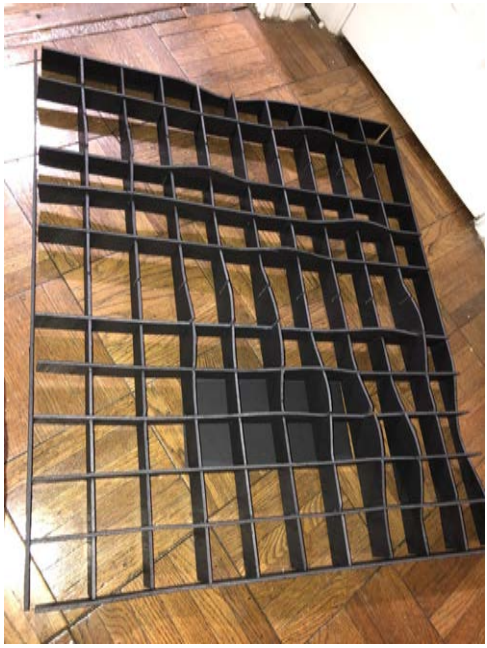


For the prototyping phase, foam core was used for the individual panels, and cut using an exacto knife.

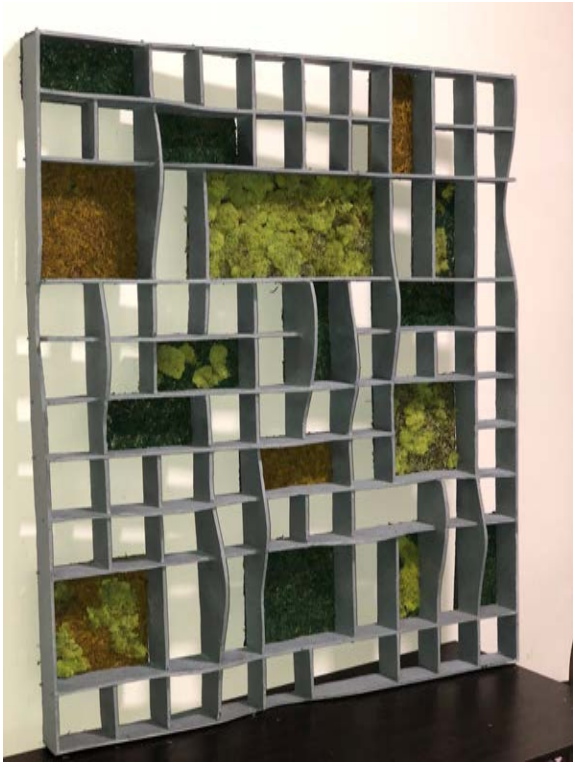
The prototype was constructed at ¼ scale.

Notches cut into the horizontal and vertical pieces allowed them to fit together without adhesive.

The surface would be spray painted, therefore the foam sections were spackled to avoid the spray paint from dissolving the foam.



SCALE MODEL



The final moss panel at ¼ scale.

The structure was coated with a textured spray paint to emulate the porous concrete.

The moss was preserved, therefore not living.

In the final form, moss would grow on a surface that would retain moisture and allow the moss to absorb nutrients from its surroundings, while also absorbing sound.

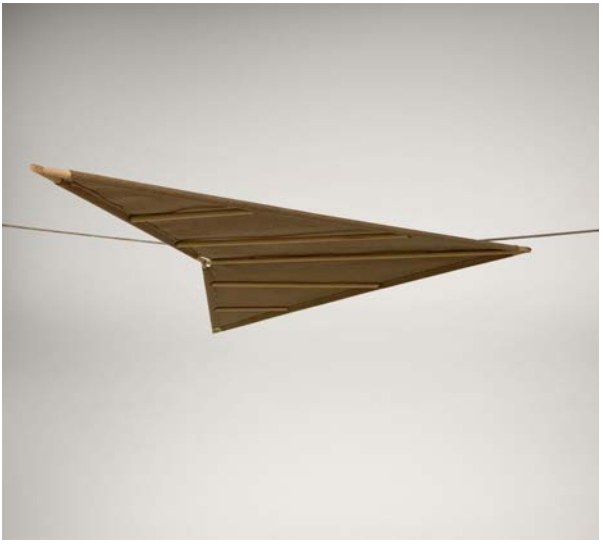
SCALE MODEL PROCESS

While building the first appearance model, a variety of methods were used. Aluminum rods were cut to size and initially meant for the frame. Soldering and welding did not hold so other options needed to be explored.

Using wood for the whole frame was an option that was pursued after research was done on weather-proofing wooden dowels for long-term, outdoor use.

SCALE MODEL

The final shade at ¼ scale.



SOLUTION

COMPLETE SCALE MODEL

¼ scale appearance model of all coworking space components

the site

this design brings purpose to the site, honoring the Wright Cycle Co and first airplane

the community

local businesses, neighbors and downtown professionals have a space to gather, collaborate and innovate

the partner

ability to host events and showcase site with little maintenance

Conclusion

In order to create a successful coworking space in an urban environment, the identification of layout and seating was explored to ensure workers could feel comfortable in their work environment.

Additionally, the built in noises of the urban landscape present the issue distractions and limited productivity, therefore sound management serves the role of providing balance when working outdoors.

Lastly, as the space is outdoors, the elements threaten the ability to perform tasks in the way individuals are able to in traditional office environments, therefore weather management allows the space to be utilized as a productive outdoor hub.

The Wright Connection Coworking Hub invites the community to enjoy their historic site with all the features of this new installation.

These steps are actions that could be tackled by either OSU students or NAHA before the implementation of the coworking space.

01 **Strength Testing**
for concrete structure to ensure longevity

02 **Rain Collection System**
to use for watering moss, reducing maintenance

03 **Reduce Noise Coefficient**
by running further tests on living moss walls

04 **Site Programming**
including advertising, signage and events

05 **Maintenance Schedule**
for NAHA to take care of moss, grass upkeep and trash

05 **Technology Installation**
of electricity under walkway and WIFI in neighboring building

https://docs.google.com/forms/d/1sxA_8C7sAtcDbzfjfT-uFGzqVezGqvZpemdLO9yifps/edit?usp=sharing

https://docs.google.com/forms/d/1uT5mGd9Fcn_K5RK8j3fezlYA_8wqg7a8G53SKzYgiig/edit?usp=sharing

https://hbr.org/2015/03/stop-noise-from-ruining-your-open-office

https://collection.cooperhewitt.org/objects/2318798872/

http://scienceline.ucsb.edu/getkey.php?key=975

https://study.com/academy/answer/when-visualizing-moss-a-low-lying-soft-green-plant-may-come-to-mind-would-this-visualization-reflect-the-gametophyte-sporophyte-or-rhizoid.html

https://ohiomosslichen.org/moss-photos/

https://www.troldtekt.com/product-properties/good-acoustics/advanced_acoustics/different-absorber-types/

https://earthjournalism.net/resources/noise-pollution-managing-the-challenge-of-urban-sounds

https://greenoasis.com/serenitiles/

https://docs.google.com/spreadsheets/d/1m-htWGnGNkrYVGsHGLB_bEra5BDqeoPdMxB6cMs_6vI/edit?usp=sharing

https://wrightbrothershistory.blogspot.com/2016/10/1127-west-third-street-wright-cycle.html