



Joshua Tree Observatory

Low Desert | flora inspired design

Brian Castro | *third-year B.S. Architecture at Georgia Tech*

Chloe Kiernicki | *third-year B.S. Architecture at Georgia Tech*

Maya Neal | *third-year B.S. Architecture at Georgia Tech*

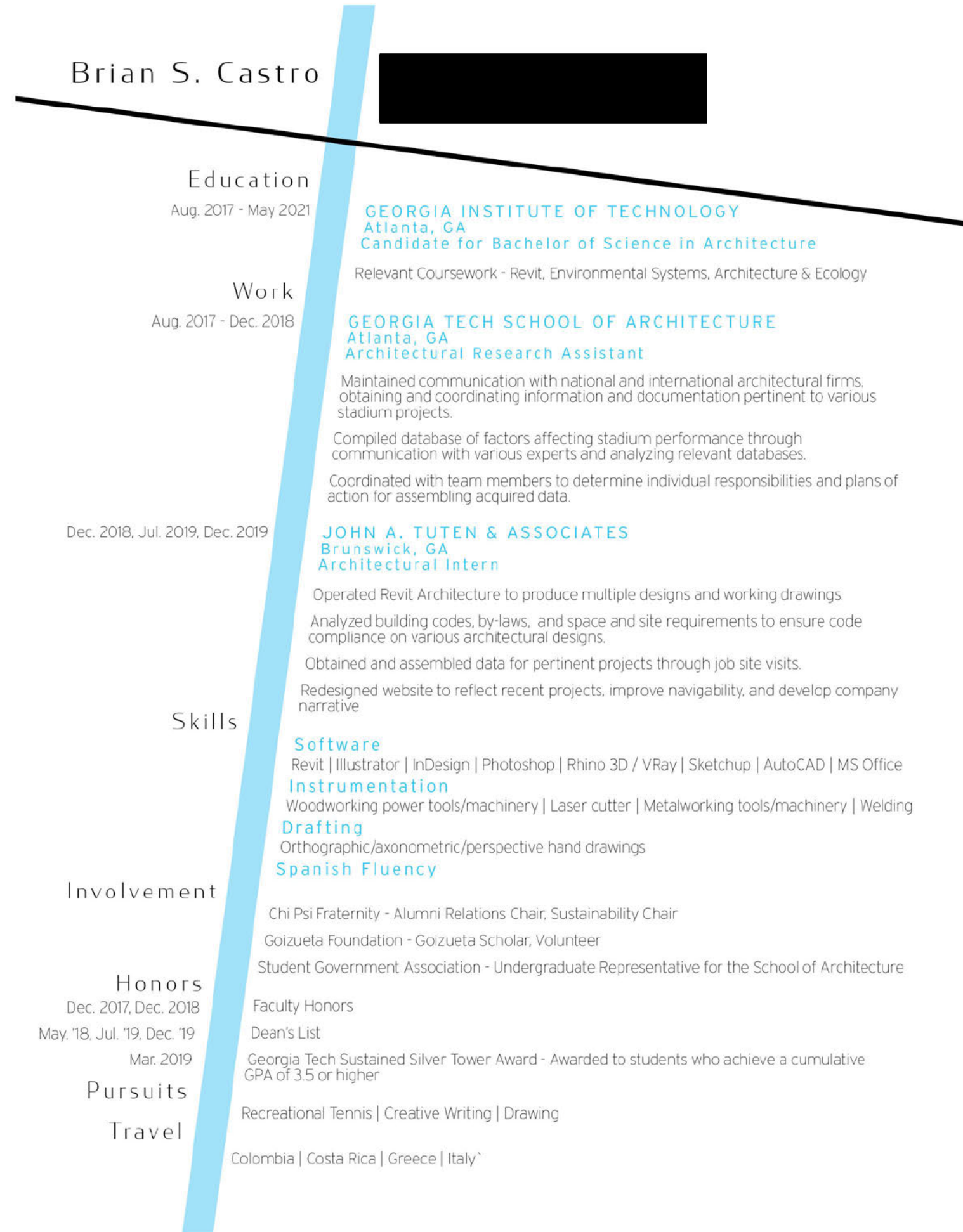
Team Member Biography + Resume

Brian Castro

BIOGRAPHY

Perhaps as someone who was born in a city and lived in one for nearly the first decade of my life, one of my greater interests during my most curious years were of buildings and people, and witnessing the relationships between the structures we form and the humans who inhabit them. This exposure quickly grew into curiosity, and then into desire, so that by the age of ten I had decided that my future lay in architecture, and to this day, having finished my third year as an undergraduate at Georgia Tech, that passion has never wavered. Although there are many facets of architecture which excite me, it would perhaps be, as a hopeful architect, the active role in providing places which not only serve the needs of its occupants, but also engage in dialogue with the surrounding environment to describe the values and cultures of a society, which may last for decades, and potentially centuries, to come. The design of a building or structure can exhibit a powerful influence upon the behaviors and experiences of people; as a sort of extension of the human mind, architecture itself lends well to the biological and emotional aspects of man. It becomes important, therefore, to design a space which is conducive to its purpose; whatever program it may serve, effective architecture acts as a facilitator between the people and their goals.

Over the past few years I have experienced tremendous opportunities which have, in one way or another, contributed to my evolving understanding of what role architecture plays within society. In my first year of college, I worked as a research assistant on a project which attempted to analyze what urban factors (like public transit, proximity of businesses, etc.) may affect the utility and performance of a sports stadium, with the ultimate goal of developing an algorithm for determining their optimal location within a city. In a recent summer, I was able to study abroad in Europe, traveling throughout much of Greece and Italy to learn about historical ideas and practices of art and architecture from antiquity to the Renaissance. Experiences like these, among many others, have helped to shape my understanding of architecture's role from the past into the present, and with this foundational knowledge I hope to contribute towards what it will mean within the future.



Chloe Kiernicki

BIOGRAPHY

I chart my life as a series of parks. Yet, the urban park is often a contradiction: an image of untouched land that is carefully constructed to match visions of the countryside, while maintained to ensure proper irrigation, pest management, and gradation. My first park is Freedom Park, the green space that remains from the efforts of a successful citizen-led protest that prevented the cutting of the urban fabric to create an inner-city highway. It is a pseudo-natural space that only exists because humans tried to pave over the houses that once stood there. While I grew up there, I experienced a neighborhood in tension: the community changed around our little ramshackle blocks and homes as money slowly trickled into the area. I saw first-hand the value of public spaces to allow neighbors to interact with each other as they form and express a communal identity. I learned that I was a wild young creature who wished to run rampantly with other neighborhood children, regardless of when they moved in, through thickets and screech at the worms we discovered under our sidewalk pavers.

Through experiences outside of Atlanta, I observed the capacity of parks to bring neighbors together by providing specific activities and infrastructure to engage with. While studying in Tokyo, I joined a group of retirees to participate in the national morning calisthenic exercises that were broadcast over the radio every morning at our park. Through these exercises, I formed friendships with residents, some of whom I still exchange photos and postcards with, and joined their English salon to practice conversation skills. I pushed myself beyond my comfort zone, which at the time consisted of sketching and writing observations safely from the skirts of the park; I moved beyond my recognition of the import of public spaces to actively utilize them to expose myself to new experiences and viewpoints.

In the summer of 2019, I worked with the provincial design institute in Guangzhou, China. Immediately after I moved, I sought a local park where I could meet locals, practice my language skills, and seek to understand more about Canton culture. Yet, I was drawn instead to the stark contrast of the urbanized sprawl of the rapidly growing city and the green lung of the park that filtered the polluted air and provided a home for the city's increasingly encroached upon fauna. In Guangzhou, I utilized the park as a platform to inform my design decisions in the office: when designing a bio-filtration park for a nearby city, I visited the park to study the organization of the native species, water sources, and human access. I observed meticulously to understand these relationships and to improve them in another context that produced a design that could serve natural and social purposes. Moreover, I recognized in myself the innate desire to be in nature, and I realized that this desire exists in many city-dwellers. Even though I have always loved the hustle and grime of city life, I have an equal desire to hear the call of a crane or the cry of the locust to signal the heat.

My current park is Home Park, the eponym of my local park and neighborhood. I visit the park daily to sit in the grass and read a book, chat with a neighbor, or search unsuccessfully for four leaf clovers. Throughout high school and college, I have pushed myself to breakneck speeds, not satisfied unless my body and mind surge past the point of exhaustion and into collapse. I have sought the feeling of narrowly escaping drowning and precariously grasping measures of success. In Home Park, I force myself to slow down, appreciate the present moment, and listen to what moves around me. I bring this personal clarity and understanding of the relationship between the urban and the pseudo-natural with me as I look toward my professional goals.



chloe kiernicki

education

georgia institute of technology
 b.s. architecture
 expected graduation: may 2021
 major gpa: 4.00, overall gpa: 3.83
 tau sigma delta design honor society

summer school:
 tokyo institute of technology
 estonian academy of arts

skills

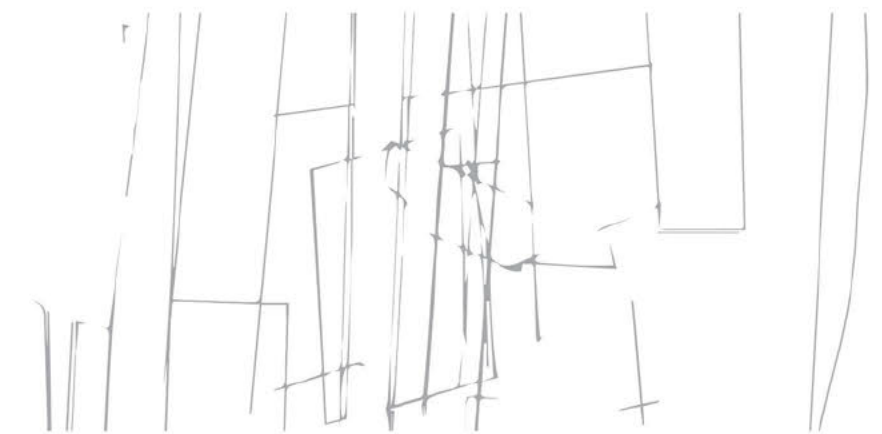
adobe:
 illustrator
 photoshop
 indesign

3d modeling:
 rhino
 grasshopper

other software:
 autocad
 arcgis

creative:
 collage
 animation

fabrication:
 glass manipulation
 cnc, 3d print



experience

guangdong urban and rural planning and design institute guangzhou, china
may - august 2019
gdupi.com/en.php
 - researched vernacular architecture of the region
 - used parametric tools to create wetland park for bio-filtration
 - designed public complex for small village
 - presented research findings to chairmen within the organization

city of atlanta, department of urban agriculture atlanta, ga
may - august 2018
aglantia.org
 - drafted designs that represented farmers' ideals and products
 - collaborated with local stakeholders to create maps, way finding, and rendered collages
 - evaluated empty lots to become future urban farms

research

re-wind atlanta, ga
august 2019 - now
re-wind.info
 - construct 3D thin digital models from point clouds and public airfoil data of wind blades to be used for testing designs
 - work across three institutions in three countries to collaborate on design, engineering fundamentals, and social aspects

sustainable undergraduate research fellow atlanta, ga
january - may 2019
 - one of 24 students selected to foster engagement with the living building, the only net positive building in the southeast
 - member of the communications design team to explore student energy consumption and behavior change

leadership

undergraduate student advisory board january 2020 - now
 - one of 2 junior representatives to meet with chairs of the school of architecture to discuss student sentiment

eco: school of architecture sustainable studio january 2020 - now
 - vice president, undergraduates
 - research materials sourcing and environmental practices

georgia tech student foundation august 2015 - now
 - one of 16 members on the board of trustees
 - manage the visual identity and brand definition exploration to target new members and articulate the value proposition

Team Member Biography + Resume

Maya Neal

BIOGRAPHY

I am currently a rising fourth-year architecture undergraduate student at the Georgia Institute of Technology. My introduction to the arts was through dance. I initially sought dance to be my creative outlet as a mode of exercise and to express myself. Through high school, I majored in dance and discovered I enjoyed working and experimenting with different materials. I began designing various models made of clay, wire, wool, and paper. I was intrigued by the precision of origami and began to do research on how it has been used in modeling to transform the built environment. In addition to origami, I had an interest in learning about the physical composition of building materials and geometry and how they work in tandem in building design.

The second influence that shaped my interest in pursuing architecture was my summer trips to cities in China and Singapore. Not only did I gain a greater respect for the architectural history of Beijing to the skyscrapers in Shanghai, but I also gained an appreciation for the city planners who had to figure out how these cities provide for their citizens. In Singapore, opened my eyes to how they make sustainable design an integral part of their city planning. Since then, I have learned more about sustainable design, from taking courses in city planning about sustainable cities — and their importance now more than ever, and studio projects that deal with the ecology of a changing coastline due to sea level rising.

I intend to pursue a graduate degree in Landscape Architecture because I want to influence the built environment through the reclamation of abandoned/rundown paved areas around cities to promote sustainable living through equitable designing of community gardens, parks, and playgrounds. I am also considering pursuing a double-masters which would either include City/Urban Planning with LA or an Architecture program. Either would help me to gain a deeper understanding of the built environment but at two different scales. With a graduate degree in Architecture, I would research/design how communities can gather in buildings, which has become more of a prominent issue with the reopening and social distancing measure across the globe. With a graduate degree in Urban Planning, I would use programs such as GIS to investigate cities in partnership with locals on current vulnerabilities they face due to climate change. Then help them to create a plan to mitigate those communities from the city's vulnerabilities. Though this is my current design path, I remain open to further refine my skills outside the classroom in the professional scene.

MAYA FREEMAN NEAL

EDUCATION	
Spring 2021	Georgia Institute of Technology - School of Architecture - Atlanta, GA Candidate of Bachelor of Science in Architecture Minor in Sustainable Cities Concentration in Sustainable Design
EXPERIENCE	
Summer 2019	MDT-Tex Architectural Intern Tyrone, GA <ul style="list-style-type: none">• Designed and formatted idea books for MDT-Tex clients including: Chick-Fil-A, 2020 Dubai Expo Partners, Portman Architects, and Hospitality groups (hotels and restaurants around the Atlanta)• Produced Autocad layouts of MDT-Tex Products• Laid the foundations for the redesigning of the existing facilities in Tyrone, Georgia as they expand their current facilities• Collaborated with coworkers to design custom umbrella layouts for client's outdoor spaces.• Worked with the CEO and Manager to generate new designs for a transportation hub as a building typology
SKILLS	<ul style="list-style-type: none">• Highly Proficient in Adobe Suite: Illustrator, InDesign, Photoshop• Proficient in Autocad, Rhino, Grasshopper, and Sketchup• Proficient in Microsoft Office Programs and Google-based Office Programs• Ability to adapt and learn new programs quickly
LEADERSHIP	
Fall 2019 - Present Spring 2020 - Present Fall 2019 - Present Fall 2018 - 19 Fall 2018 - 19	<ul style="list-style-type: none">• Director for Extended Orientation New Student Transition Programs at Georgia Tech• Alumni Liason Georgia Tech's Womxn's Club Ultimate (Wreck)• Finance Chair National Organization of Minority Architecture Students (NOMAS)• Team Captain Georgia Tech's Women's Club Ultimate B Team (Wreck)• Graphic Design Chair National Organization of Minority Architecture Students (NOMAS)
EXTRACURRICULAR	
Fall 2019 - Present Spring 2018 - Present Fall 2017 - Present Fall 2018 - Spring 2020	<ul style="list-style-type: none">• Honors Leadership Council GT Honors Program• NOMAS Member National Organization of Minority Architecture Students• Wreck Women's Club Ultimate Team• For The Kids Philanthropic Student Organization
RECOGNITIONS	
Fall 2017 - Present Fall 2017 - Present F2018, F2019, S2020 Fall 2018	<ul style="list-style-type: none">• Georgia Tech Honors Program• Zell Miller Scholarship Recipient• Dean's List• Faculty Honors - 4.0 Semester

Site Selection

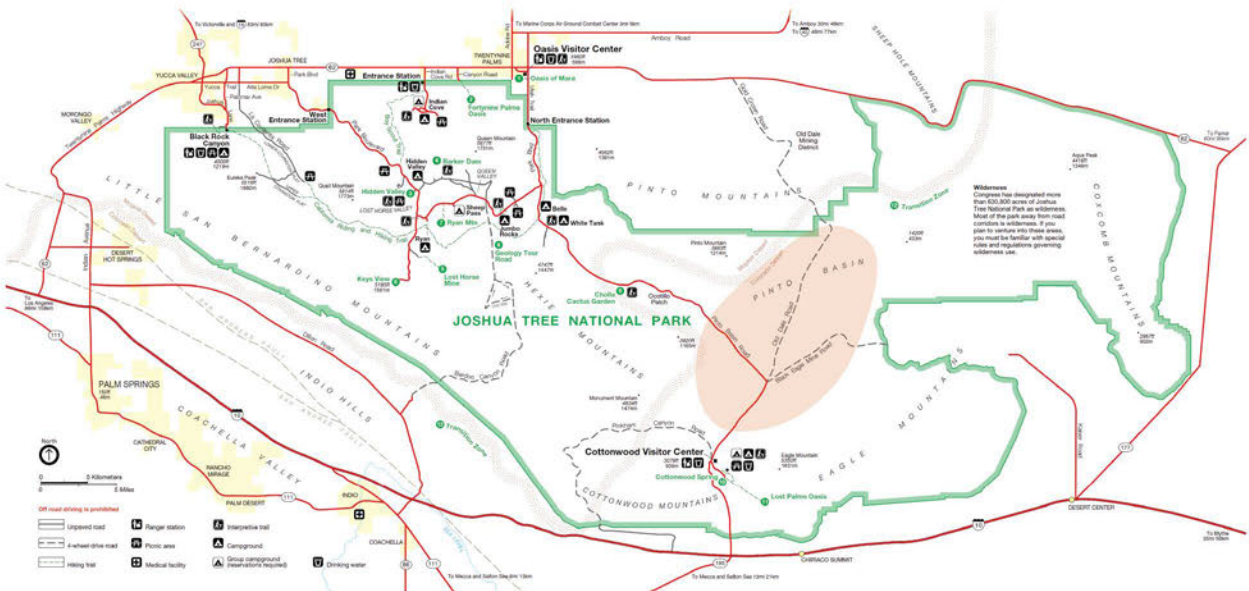
LOW DESERT

Joshua Tree National Park

The *Joshua Tree Observatory* is located in the low desert terrain of the Pinto Basin. Specifically, the site is in the low altitude region of the Joshua Tree National Park, along the main road, Old Dale Road. This low desert area is accessible primarily to cars, four-wheelers, bicycles, and other forms of vehicle transportation. There are a few hiking trails in the area as well, so the site can serve as a place of respite for multiple categories of park visitors.

This location was chosen due to its temperate nature and low humidity, making an outdoor intervention feasible year-round. The remote nature and large acreage of Joshua Tree creates an environment popular for stargazing and facilitates a habitat that enables local flora and fauna to flourish. Within the national park, the site is located in an area far away from other rest stations, so this facility for rest and respite adds to the existing network of stations while connected through the park's infrastructure.

The intervention connects to the site through meeting the needs of hikers and campers in the area: the platform provides a steady and level base for astrophotography, the branches and bulbous top provide shade below, and the seating provides space for rest and an area to lay one's backpack. Furthermore, the vegetation and birds of the low desert can still coexist in proximity to the structure. The intervention touches down lightly as to not widely disturb the earth and provides nooks and branches for birds to perch when it lies vacant. Through low-impact design that focuses on natural materials and working with the local terrain, the site situates itself amongst the other Joshua trees, standing out while also blending in.

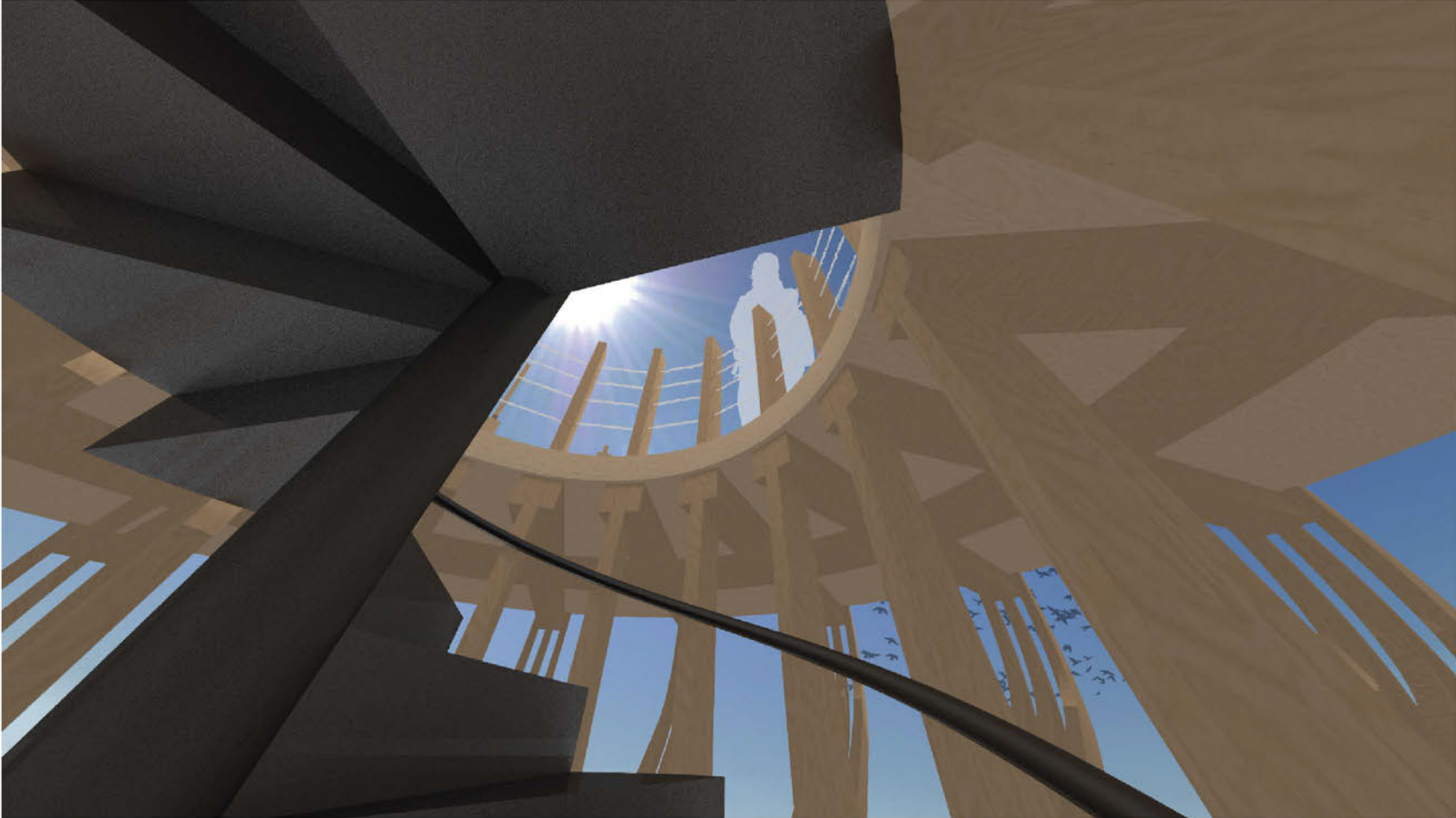






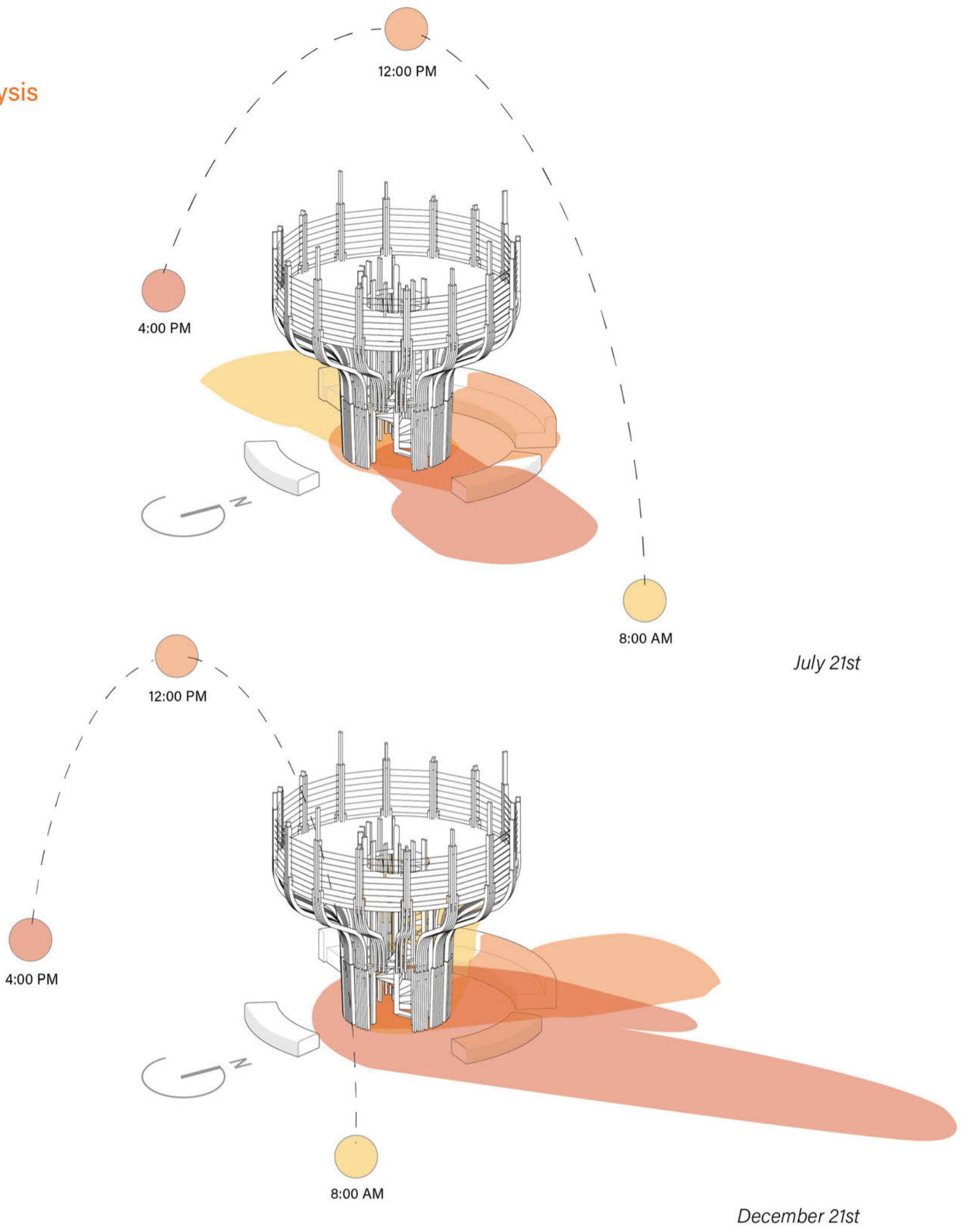


Interior Promenade

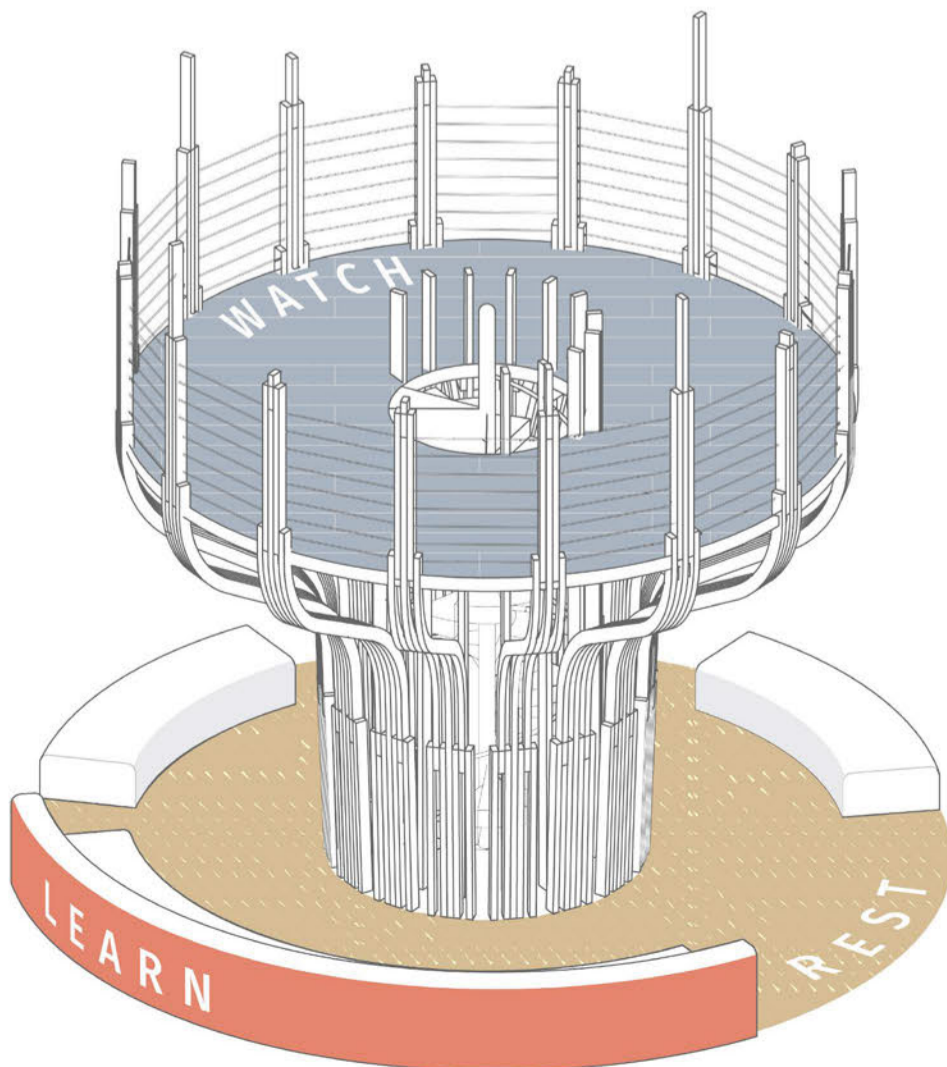


Diagrams

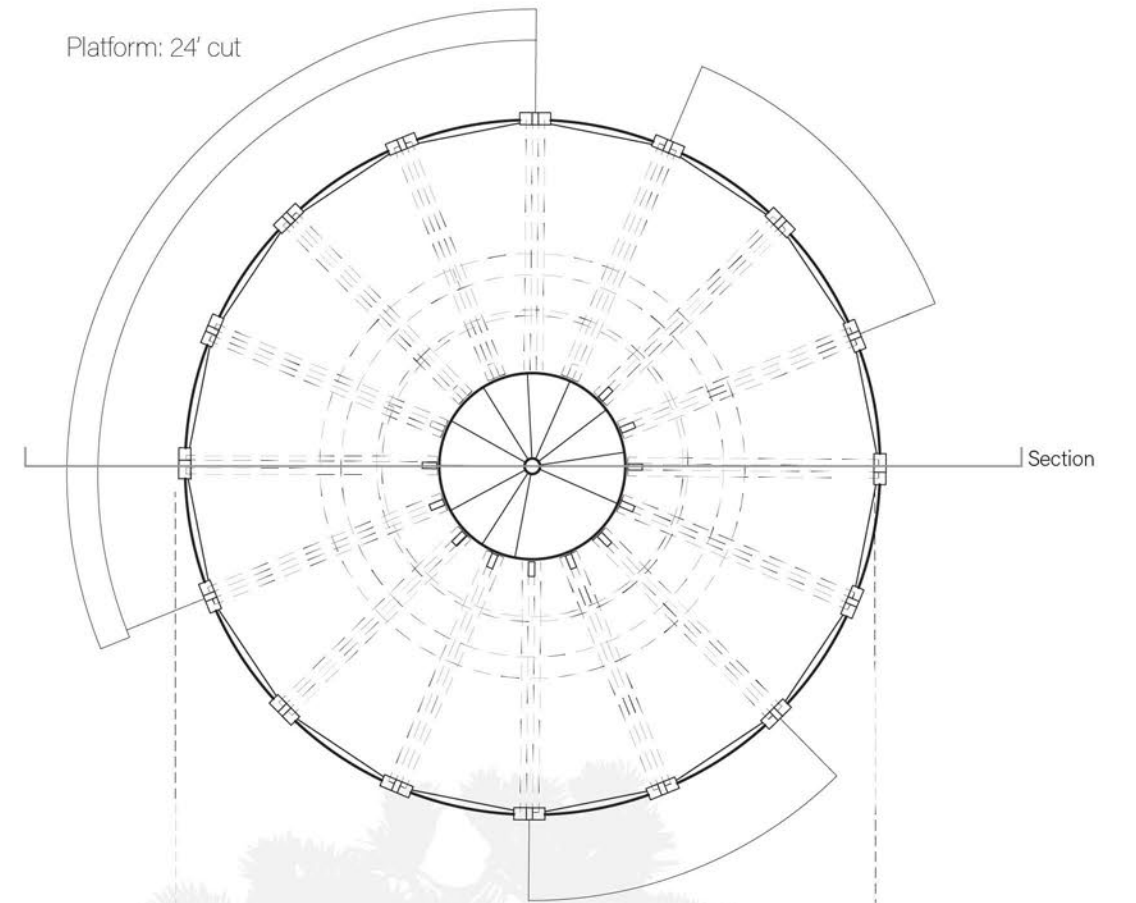
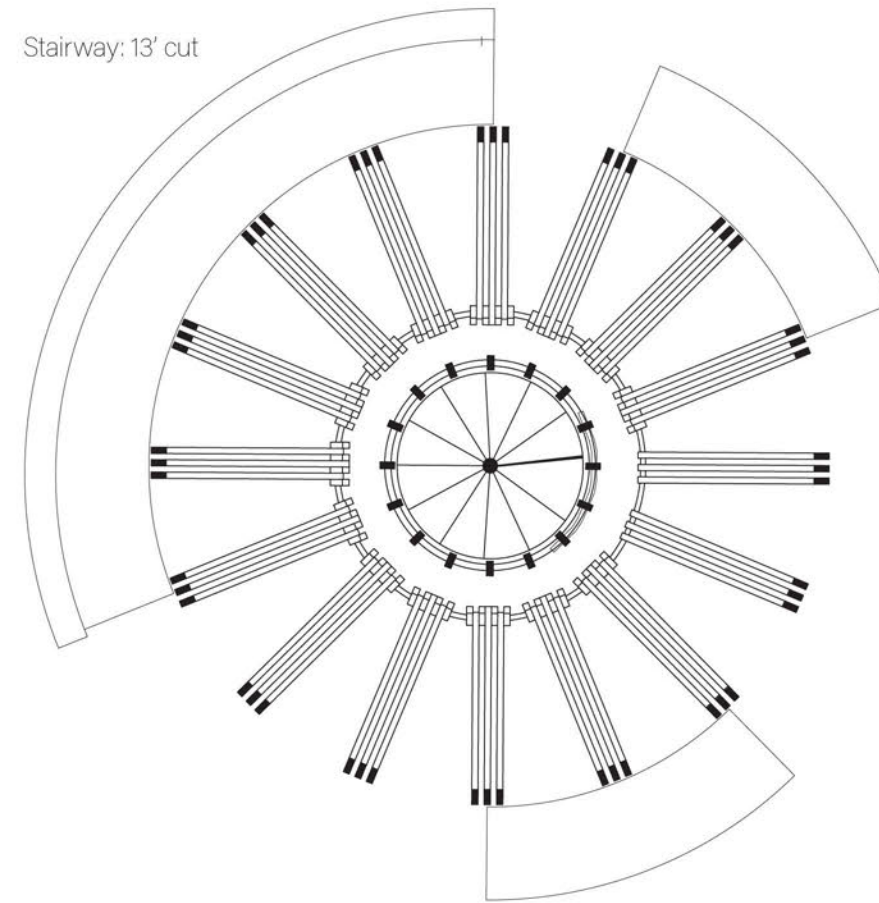
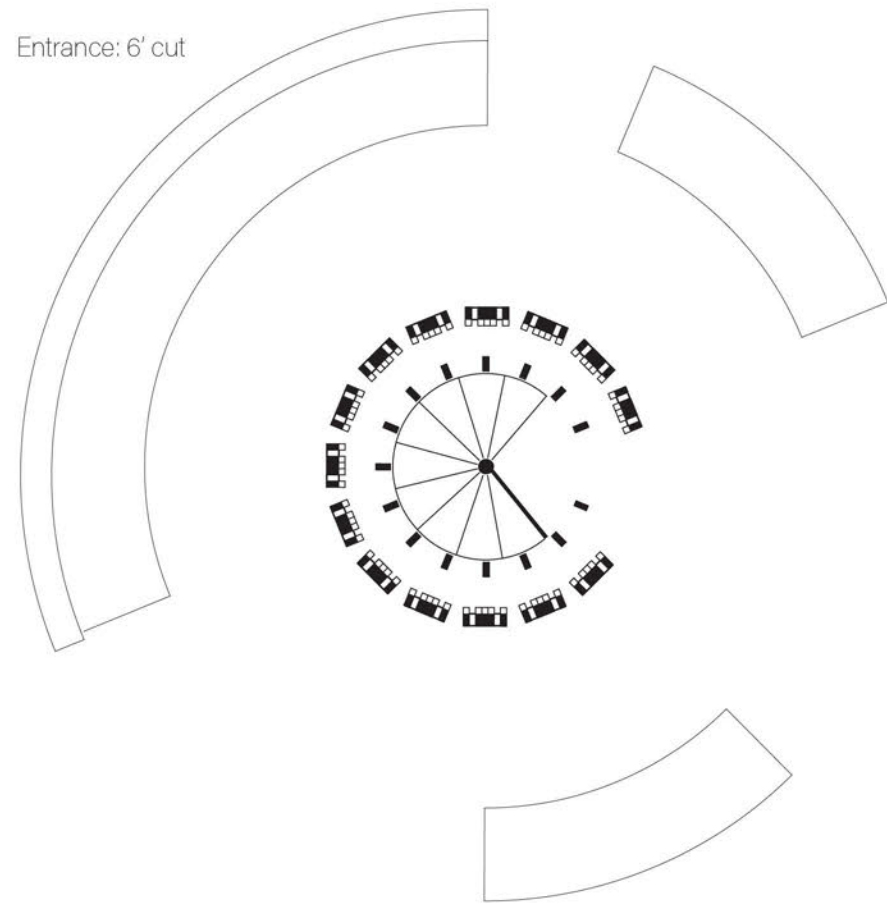
Solar Analysis



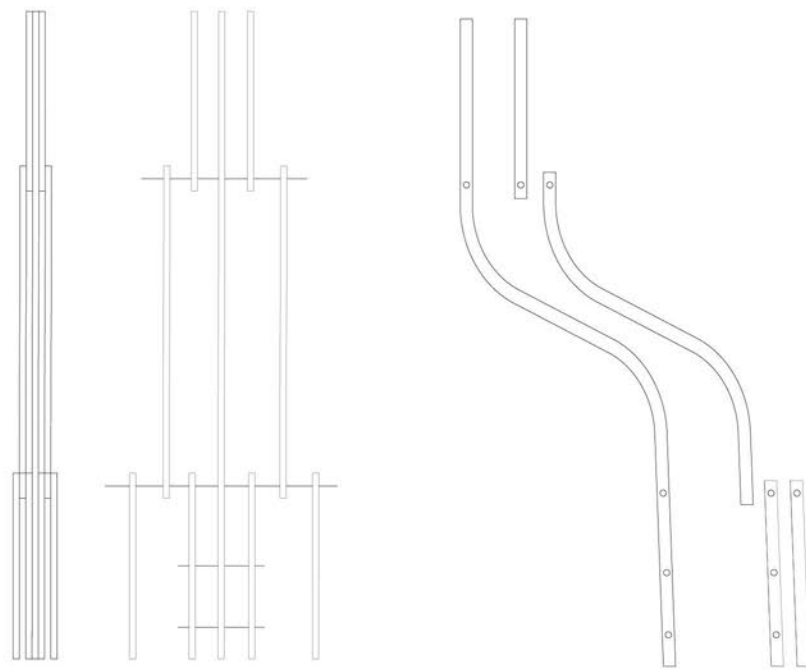
Program



Structure Plans + Section

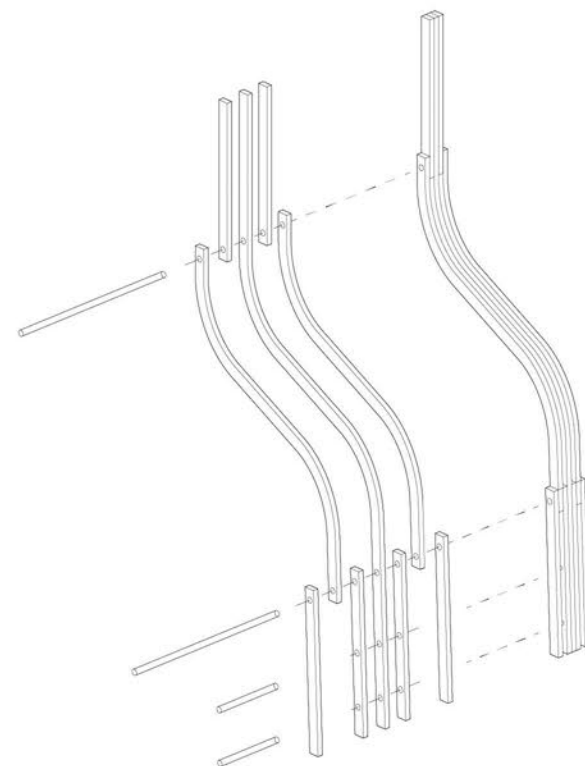


Branch Construction Detail

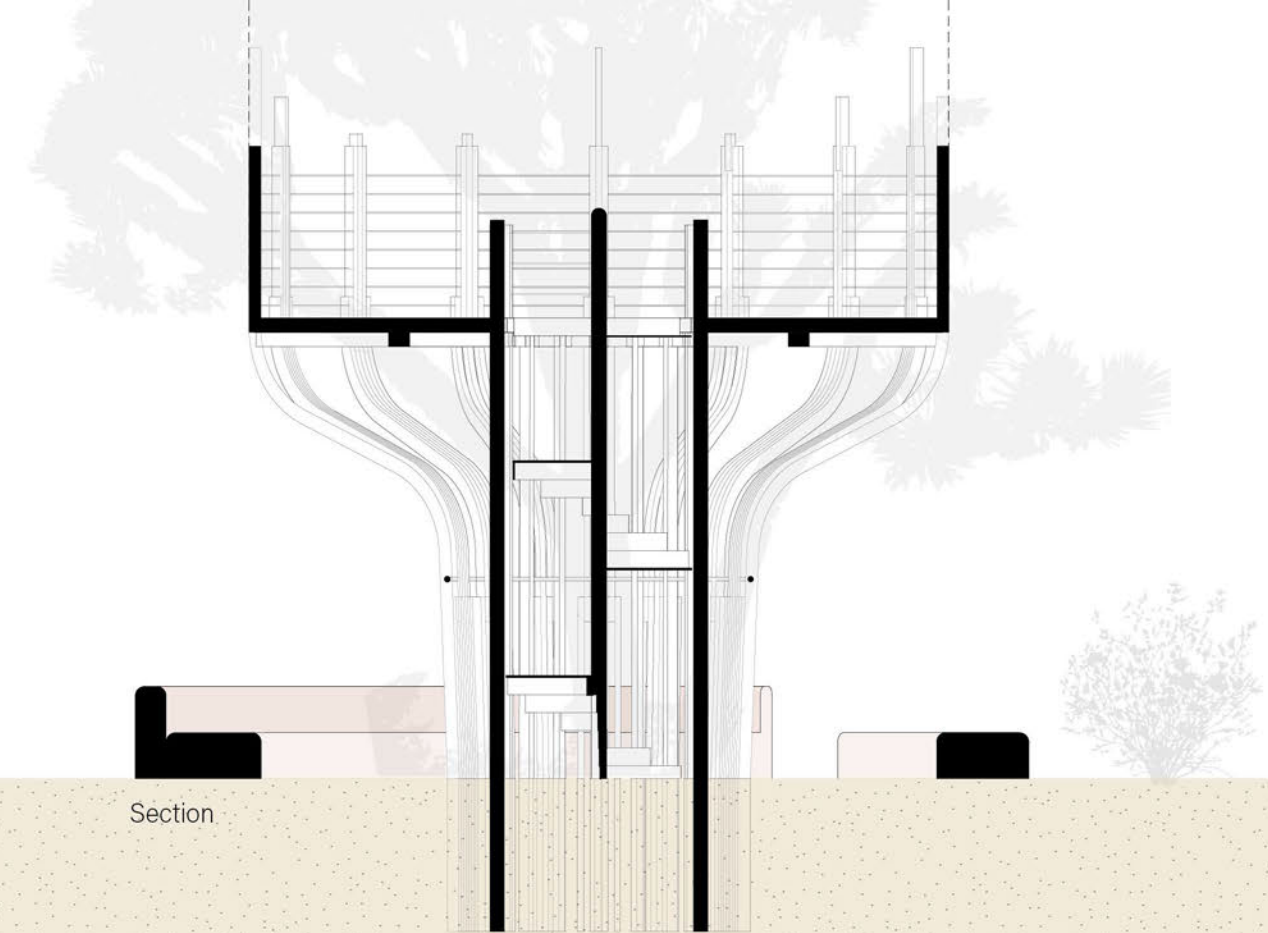


Front

Side Elevation



Isometric



Section

Project Narrative

WHAT MATERIALS AND METHODS ARE USED TO BUILD/INSTALL THE STRUCTURE?

Our approach to sustainability begins with the materials. While being stringently conservative with what is necessary but environmentally costly, we allow for more easily replenishable materials like wood and adobe to embrace their particular strengths and fully express the form of the structure. Redwood standard lumber defines most of Joshua Tree Observatory, as it is a durable wood for outdoor uses and is naturally sourced within the same state of California. Adobe will mold the seats which encircle the tower, not only borrowing elements of traditional building methods from the Southwest but also remaining harmonious with the earthen nature of the land. Steel, known for its high carbon footprint, will be used sparingly in providing the necessary stability in both the tower's foundation and in its vertical member support.

WHAT IS THE ESTIMATED BUILD/SETUP TIME?

The process involved in assembling this structure will entail many steps, beginning with site surveys and evaluations within the park for optimal locations. The next crucial step would involve sourcing the lumber, adobe, and metal. Each component—including the structural support rings, viewing platform, and vertical wood members—will be fabricated off-site, ready for assembly once everything arrives at the destination. Most of the time invested in this project is expected to be in planning the logistics and in fabricating the components. Assembly and installation itself are intended to start and finish within two days, with an overall expectancy of approximately three months for preparations.

HOW WILL COLLABORATION BE UTILIZED IN REALIZING THE DESIGN?

Collaboration is a central feature of making a project possible. We extend the strategy of keeping things local by reaching out to several of the artisans we found in the immediate area around Joshua Tree National Park to assist in fabricating each sub-component of Joshua Tree Observatory, whether that may be a wood member, the seating, or even the structural steel ring. In this process, we have identified a few such craftsmen within southern California who could help elevate construction materials into the realm of sculpture.

Project Narrative

HOW WILL THE STRUCTURE BE USED BY THE PUBLIC?

Joshua Tree Observatory is ostensibly a place of respite for the weary travelers who explore the arid splendor of Joshua Tree National Park, but we saw no need to end the story there so soon. Seeking to understand what happens at this park, what animals and plants live there, and why people visit this corner of the earth was an integral process towards informing our design and knowing what Joshua Tree Observatory could do to enhance the experience of every person who crosses paths with it. We sought to capture a moment in time and space where a traveler has something curious to witness of the park's natural beauty, whether she stumbles upon it in the day or at night, in the heat of July or the cool of December. Joshua Tree Observatory does not just shade the traveler, but literally elevates her into a plane of reality where she can gaze farther in the distance or reach closer to the sky. Joshua Tree Observatory is a point of discovery, offering pieces of knowledge on the flora and fauna which inhabit the area or of the ancient history of the surrounding formations; an inquisitive mind need only explore behind the seats to uncover these facts. Whether an explorer comes equipped with binoculars, a telescope, or simply her own eyes, Joshua Tree Observatory stands to enrich her discoveries. We hope that when someone comes upon Joshua Tree Observatory, she may see the connection its form holds with the park's eponymous plant. With its thick, bushed spindles straggling out in every direction, the Joshua Tree lends itself to a top-heavy appearance, a visual curiosity that we ultimately abstracted into a tree of our own. The person who examines Joshua Tree Observatory may find herself ascending the interior staircase, always capturing a filtered glimpse of the horizon expanding with every step she takes before the grand sky is revealed to her at the top of the stairs, and she witnesses the park in its entirety from up above the desert plain.

HOW DOES THE STRUCTURE ADDRESS THE CLIMATE IN WHICH IT RESIDES?

The low desert of Joshua Tree National Park, in most ways, is what one would expect of an arid climate. There is very little rainfall each year, and temperatures in the spring and fall tend to flow between 50 and 85 degrees Fahrenheit (10-29 degrees Celsius). To help address this, redwood lumber will be used for most of the structure for its natural sturdiness against the outdoor elements, including the sand and soil that is blown in the wind. Even under these conditions, redwood structures can typically expect to last over 50 years. How Joshua Tree Observatory responds to the climate does not end in its materiality, however. Following the generalized metaphor of a tree inspired by the iconic plant (which, despite its name, is not actually a tree; it is classified as a yucca), the very form of the tower is designed to offer a spot of shade amid a vast expanse of hot sunlight. The seating is arranged in such a way so as to ensure that a passerby can rest, have a meal, or chat with her partners while sitting comfortably in the shade at most times of the day. Taking advantage of this form, it almost seemed natural to rest an inhabitable platform on top of the tower to allow for enhanced views of the landscape.

Project Narrative

WHAT TYPE OF TECHNOLOGY IS IMPLEMENTED IN THE DESIGN?

In tandem with our conservational approach to sustainability, which involves not only utilizing replenishable, local materials, but also in minimizing energy and resource demands, we intentionally sought what might be considered a “low-tech” approach for Joshua Tree Observatory. Rather than making considerable investments into new or experimental technology, we decided to engage in a more tried-and-true methodology using traditional techniques (like adobe construction) that are known to have minimal impact on the environment. We feel further justified in adopting this direction through our understanding of why people tend to visit national parks like Joshua Tree. Apart from utilizing the necessary technology for safety and navigation, park visitors tend to practice a spirit of communing more closely with nature, and thus may opt to refrain from modern distractions for the duration of their outdoor excursions. Therefore, we feel that the people who would venture out into these remote parts of the earth may more likely appreciate a structure that is both sophisticated in its form and simple in its technology.

WHAT MAKES THE DESIGN ENVIRONMENTALLY FRIENDLY + SUSTAINABLE?

As mentioned previously, our strategy for sustainability relies primarily on the smart management of resources. We ensured that Joshua Tree Observatory is composed primarily of materials which are renewable or require little energy to produce. Any non-renewable materials were used very conservatively, and only at points of critical support for the structure. The other half of our strategy entails concentrating the entire process to the local vicinity by employing only craftsmen from the area to produce the components, and sourcing our materials from nearby locales.

HOW DOES THE PROJECT ADDRESS A HIGH QUALITY AND UNIQUE AESTHETIC?

By expressing a form that relates itself to the iconic foliage of Joshua Tree National Park, we invite visitors to engage with the environment in a fashion fairly novel to the desert. We encourage them to climb a tree, so to speak, that they otherwise might not climb, or to rest in its ample shade. We allow them to inhabit a greater view that rests well above the plain. Joshua Tree Observatory is not just a rest stop, we hope for it to be a waypoint of discovery and engagement as travelers explore their way throughout the park. We aimed for small moments of splendor to occur at virtually any time of the day or night, creating a phenomenological experience tied to the rhythm of the shadows and the light both within and without the tower as it marks the passage of time.

ADDITIONAL INFORMATION ABOUT THE PROPOSAL

Though this particular design is contextually informed by Joshua Tree National Park, we envisage the possibility of this system being employable in other low desert parks. By utilizing the same materials and construction methods as Joshua Tree Observatory and inviting the services of local artisans in defining each form, we see a host of pavilions throughout the low deserts that share a common thread of idea and materiality, but each possess a wholly unique character.

Project Narrative

PROJECTED COST ESTIMATES

Component	Material	Price	Additional Notes
<i>Support Structure</i>	Steel Rods	\$1989.00	[9] 2" diameter 6'0" L
<i>Railing</i>	Steel Cable	\$310.33	Length needed 552ft 1/8" ; [1] 500' L + [1] 100' L
<i>Seating</i>	Adobe (clay mixture)	\$2500	Made by local adobe clay craftsmen
<i>Underground Structure</i>	Steel W-Beams	\$1760	[4] 6x6" , 1/4" Th ; 20' L
<i>Columns</i>	Treated Redwood	\$2040.82	[146] 3x6" ; 16' L
<i>Entrance Support</i>	Steel Rods	\$884	[4] 6' L
<i>Stairs</i>	Sheet metal + Steel Pole	\$1000	
<i>Professional Fees</i>		~\$3000	Land Surveyor, Permit, National Park Fee
<i>Local Artisans + Skilled Labor</i>		~\$15,000	Fabrication, Construction, Local Crafters

SUBTOTAL	\$10,484.15
ESTIMATED FEE + LABOR	\$18,000.00
15% CALAMITY	\$4,272.62
TOTAL	\$32,756.77

