Making Design

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Abstract

There are designers, and there are makers. Each responds to different considerations when working their craft. A designer is largely concerned with form and beauty, crafting objects and images. The designer may be heavily reliant on a third party maker to bring their objects to production or market. A maker is similarly dependent on the designer to provide a level of creativity to craft a product. The maker is well versed in material properties and the physical restraints provided by real-world forces, such as gravity and the consumer use and abuse of the product. When the designer and the maker collaborate, we are afforded excellent products that are as beautiful as they are sturdy and usable. We find examples of this in the architecture of I.M. Pei, his concrete structures could not be created without a solid relationship between concrete worker and architect. (see fig. 1.2,1.3)

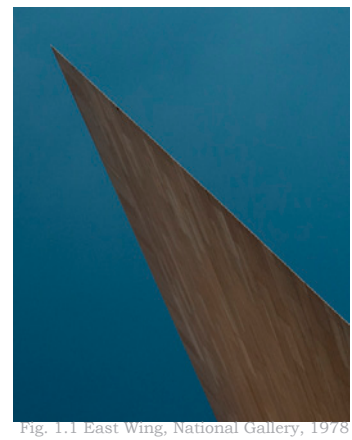


Fig. 1.1 East Wing, National Gallery, 1978

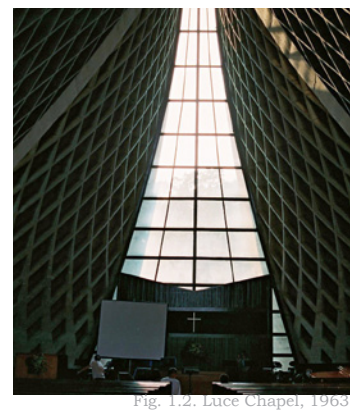


Fig. 1.2. Luce Chapel, 1963

Design-build is essentially the convergence of des igner and maker in the discipline of architecture. The design-builder is competent in material studies as well as construction techniques, with a strong background in design. This field of knowledge coupled with physical building capability sets the design-builder apart from the architectural designer.

The process of design deserves the same consideration that final design receives. For a design-builder, a rigorous method of creating form is equally comforting and frustrating.

Building materials such as dimensional lumber and plywood have, with industry standardization, become ubiquitous thus rendering them inconspicuous. Is it possible to use these anonymous materials in a celebratory manner as cladding, skin, weather protection, or simply decoration?

Fig. 1.3. Hale County Animal Shelter Designed and Built by Students of the Rural Studio

"I'd written a verb list: to roll, to fold, to cut, to dangle, to twist...and I really just worked out pieces in relation to the verb list physically in a space."[1]

-Richard Serra

Fig. 2.1. "5" from 0 through 9

Jasper Johns

Johns works depict an urbane and pedestrian subject matter while using techniques that embody a high understanding of visual representation, however often deviating from the perhaps traditional mediums of oil or water color. Johns is the first to present mundane subject matter as object d'art. He has been credited as the father of pop art, minimalism, and conceptual art, largely due to his use of everyday objects such as targets and flags, which would pave the way for artists like Warhol and Oldenburg.[1] Artists who made the mundane both ridiculous and appealing. Johns made use of the everyday imagery to allow viewers access to his work.[2] The common viewer is able to observe and contextualize the American flag, for example, or simple Arabic numerals. Johns would take the ordinary imagery and represent the forms in irregular fashion. The subject-matter was to lose all meaning and identity, and to gain the identity of representation. Johns work was about the act of art as much as the beautiful images created.

Although painting was Johns' main medium to work in, the scope of his catalogue extends into sculpture, collage, encaustic, and printmaking. Printmaking was especially powerful for his mode of work, it gave him the ability to repeat the same piece of work many times in a short period of time and observe the changes and aberrations to the art as he created. The fascination with iteration is most interesting. His ideas about change in form

due to small changes in practice are very informative. He would often make prints of his paintings, as preservation as well as an additional art form which held as much importance for him as the painting itself, the iterative nature found in making the prints is inspiring. Encaustic is the practice of dripping melted colored wax onto canvas and creating works of art from that. Johns used this to great effect in his works “American Flag” and “Target”.[3] Again the subject matter of the pieces are simple and attainable, and again it is the mode of art that is exemplified. Johns does not simply use encaustic in the fashion of traditional painters, he brings the practice into modernity.[4] By embedding scraps of newspaper the surface of the encaustic becomes even more tactile. The depth of detail and wide range of texture present in a single work provides a rich visual experience. Architectural skins and screens afford an opportunity to achieve similar richness. Modularity happens to fall neatly inline with Johns’ attitude toward design; the designer can create a single module and repeat it to create a large-scale screen or skin. The better designer allows for slight aberrations in the module in order to create a more interesting visual impact.

Fig. 2.2. 0 through 9

Fig. 2.3. 0 through 9

Richard Serra

Serra, an American minimalist sculptor, has made a significant impact on this project and process. His works at their most basic are minimalist responses to space and conditions of the human body. His design philosophy is often rooted in action and verb choice. Controversy has always existed around his work, partly due to his intrusions of public space, and partly given to his attitude toward his art and public opinion of his art. The sculpture he creates is scaled to influence the human body in ways that challenge the mind's representation of the physical space. His work "Sequence" which is a pair of steel spirals 12'9" feet tall that has been canted, unconsciously directs occupants to lean over in order to experience the interior space of the work.[1] It is this type of relatively simple gesture that gives Serra's work the uncomfortable relationship to space that exists.

Verbs and word play often factor heavily into the design and concept of Serra's pieces. His piece "Corner Cast, Night Shift" is a physical remnant of a direct action. The making of the piece occurred in the exhibition space at the San Francisco Museum of Modern Art. The piece was created by throwing, by hand, liquid hot lead into the junction between wall and floor of the space and allowing the casting to solidify. The sculpture was then pulled away from the wall and the process was repeated until 8 individual castings were laid out on the floor. The piece is a direct translation of the verb to throw, using

a liquid metal to illustrate the action. The multiple iterations of the action speak to the changing nature of action and time. It is possible to imagine how our actions are never duplicated, no matter how defined the motion may be. Each of the pieces that make up the sculpture share the form of the corner and the length between the two parallel walls that define the space, but all have distinct personalities. Serra personally threw the 6500 pounds of lead, which speaks to the process of design/build. The designer, in this case, is the producer. Designing and creating a piece of this physicality are largely two different processes in creating a piece of art/architecture. It is indeed impossible for another person to throw the lead in the creation of the sculpture, to do so would be to destroy the personality in the work that was developed through the hours of throwing and solidifying and throwing and solidifying.

Jasper Johns' work influenced greatly Serra's work. Johns painted simple forms in a number of variations in order to explore the eye's orientation to ubiquitous shapes and objects. His painting "0 through 9" [insert 0 through 9] uses numbers as subject, but not as the focus of the painting. The focus instead is on the combination of the forms and the challenging of the act of layering on a canvas. The individual shape loses all significance with in the drawing, and the play between line and void become the subject. Johns used

this manner of conception in a series of lithographs by the same title, in which the artist changed the manner of representation on the canvas. By changing medium and style of painting the artist took an idea and followed it, creating a great deal of variation on a simple subject. His subsequent renderings continued to engage an altered perception of shape and relationship of depth on a flat surface. The final iteration consisted of a physical layering of the number 0 through 9 in a three dimensional manner. It is the repetition of process with a redefinition of idea in recurring creations that heavily influenced Richard Serra's "Corner Mold, Night Shift"[2]. The piece was in fact first created in Johns' studio. However, the concept of changing perception of space or canvas most heavily influenced Serra's work.

"The space is the place of its making."[3]

-Richard Serra

Johns used simple, recognizable forms to segue between painting and perception bending. Serra uses elemental, readable, materials (steel, rubber, lead antimony) in ways that challenge our awareness of physical space.

> "I'd written a verb list: to roll, to fold, to cut, to dangle, to twist...and I really just worked out pieces in relation to the verb list physically in a space."
>
> -Richard Serra

The use of verbs are important to a design process that includes full scale production as an end goal. More often, designers are creating construction drawings as the final product and sending them off to contractors to be built. Therefore the handcraft and physical construction skills involved with design-build are directly related to Serra's view of hand construction and manual working of material.

Thesis Paper: Making Design

Architects and designers are constantly looking to create good work. This raises the question, what is good work? Architecture is a profession defined by individuality, it is then the perception of the user, critic, owner, colleague, which characterizes pleasing architecture. In the continuous pursuit of universally pleasing products, some designers challenge the way in which one designs. Integrated design, for example, is an inclusive process from the outset of the project that involves the entire range of users of the resultant architecture. While most of the users will be satisfied with the end result, some will become disenfranchised by no fault of the architect, but by personal perception. That is the nature of design. Still, more architects are turning to the digital realm to manifest real buildings. As a profession, there is a swing toward exclusively using building information modeling (BIM) software to generate very efficient buildings. Buildings designed using BIM can be made efficient with regards to environmental concerns, but are even more efficient when measuring design-time. The aforementioned integrated

designers may use BIM to create the building, but the inspiration and form are achieved far more democratically. These two design philosophies bookend the range of traditional architectural design. Between the two extremes lie most of the profession, as well as the niche design-build. Traditionally, a building will have two creators; the architect and the contractor. The architect creates the vision and the tectonics of the building, and the contractor creates the physical remnant according to the drawings of the designer. Both parties are highly specialized in their respective fields, but little crossover exists. One of the discrepancies in the expertise of the designer is an in-depth knowledge of real-world considerations surrounding the materials he specifies. Understandably, the professional architectural designer cannot have the same relationship to steel structure that a seasoned ironworker has. Similarly the concrete layer, although highly skilled, would not be expected to design the thirty-story building he is constructing. Much the way designers can speak to nuance of design and agonize over minute details, skilled tradesmen have a built-up language, vocabulary, and skill

set surrounding their line of work. Design-build professionals have created a niche for themselves as single-source builders, who are able to produce quality design work as well. A designer should be involved in the making of the things he designs. Investing time and effort to creating a real product only engenders a sense of ownership

There are several very successful design-build studios in the practice today, one in particular, the Rural Studio at Auburn University is particularly interesting as each of the projects completed, are built by the students at Auburn[1]. “The Rural Studio, conceived as a strategy to improve the living conditions in rural Alabama while imparting practical experience to architecture students, completed its first project in 1994”[2]. Dennis K. Ruth and the late Samuel Mockbee created the studio at Auburn for the two-fold purpose of creating community betterment, and also to improve the student’s ability to construct as well as design. It’s the ability to use the vernacular language and found materials that give the buildings a certain warmth and

honesty to the people of the community. These buildings are designed with the impoverished residents of Hale County in mind, so sensitivity to durability, vernacular cues, and constructability are paramount in creating the structures. With the experiences gained here, the students gain insight and knowledge to design for reality[3]. Mockbee and Ruth have created an incubator for young architecture students to grow into design-build professionals.

In a design-build model, material choice is imperative. Certainly material selection is important in classic design delivery models, but the amount of contact with the material is vastly different. Whereas the architect specifies a material for a project based on the requirements of the project and the aesthetic of the material, he will have very little to do with the working of, or installing of said material. When a design-build professional chooses a material to use, the choice carries more weight. The design-builder should be comfortable working the material, or he may incur cost over-runs with the

client. Experience with a given material will also allow the design-builder to be more creative with the application method.

The design profession is awash with new materials. These new materials, such as 3form, a poured resin with entrained decoration enhance beautiful spaces, but require minimal craftsmanship to install. Toshiko Mori of Harvard's Graduate School of Design would agree, "New materials provide designers with significant possibilities for shaping space and fabricating with new methods, yet many opportunities for innovation exist within traditional materials as well."[4] ¬¬One of the ways of exploring a material is to take said material out of its conventional context. One expects to find plywood as underlayment and sheathing, however there is a hidden ability in plywood to become more than just a covering. Harvard Design School took the thin plywood and applied techniques unique to dress making in order to create a new form[5]. The difference in Harvard's process and the process created herein is that computer modeling was utilized prior to the construction

of the skin. In creating the models in this studio, there was no attempt to predict or presuppose what the final form would look like. Both of these installations are based on a single unit and the resultant form of combining multiples of that unit. However, the final shape created was a surprise based on a slight change in iteration and repetition of form over a number of units. The test of each individual unit comes with replication over a number of units. Repetitive forms are common in architecture, so much that individual units may not be recognized in the composition of the whole. A brick wall is not a collection of bricks, and a curtain wall is read as a unitary system of enclosure, rather than the stick built frame and glass panel system that make up the components. In most cases however, repetition is used as a cost saving and time saving measure. With an interesting unit this can be quite beautiful.

The Harvard students began down a path of discovery, where the material and the technique for joining the material may have created something

quite unexpected and beautiful. The reason the project did not reach it's full potential was the introduction of the computer modeling too early in the project. The armature required to hold the plywood panels aloft was drafted out and calculated to with in the nth degree to assure the success of the project. This may or may not have been a detriment to the project, that can not be known unless a third party picks up the process of tailoring plywood but does not take the step of calculating the final result. The designer can play watchmaker with a building unit, given a depth of research and involvement with developing the unit to be somewhat predictable but allow for the contingency for an unexpected aesthetic boost.

Jasper Johns, American painter active mainly from the late 1950's through the 1970's is famous for painting urbane subjects in traditional painting techniques.[9] The subjects of his paintings included the American flag, targets, and letters and numerals. These banal, urbane subjects lend little to the visual attractiveness of the piece but are the vehicle for testing different

modes of painting and visual representation. John's practice of repetition and iteration is a diligent effort that creates many works of which "things the mind already knows"[10] Each time he created a piece of work in a series there were small changes made and a slightly different result emerged. The number five looks different when painted in monochrome than color, the edges become more or less defined and a new piece is created but with the same subject matter. The commentary centers on the ubiquity of the everyday, we become the things that surround us. And the things around us become us. Americans are advertised to ad nausea, and Johns' was hyper aware of the spoon feeding Americans were receiving.

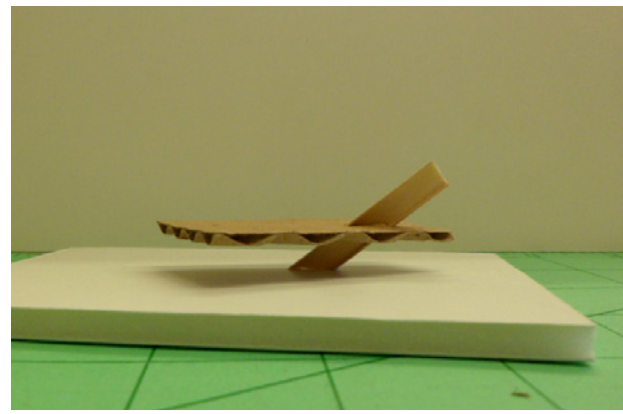
Those in the architecture and design professions should also be aware of a suffocating ubiquity predicated by cheap building materials and big box hardware stores. How often is the 2x4 considered even as an object. Building materials have been relegated to simple means to ends. Therefore dimensional lumber and sheet materials are analogous to Johns' targets and

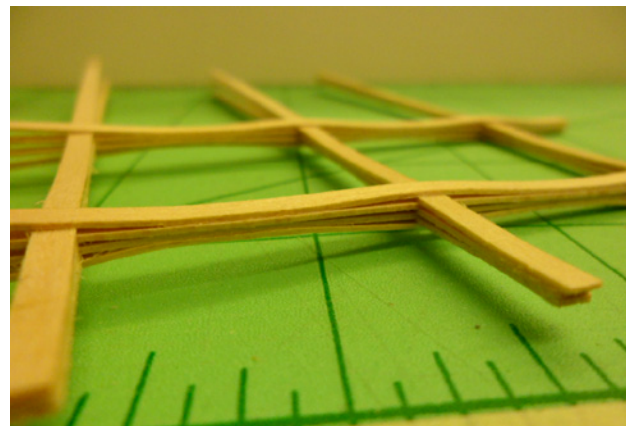
flags. Within the profession of architecture and in contracting, these are the items that the mind knows. painter active mainly from the late 1950's through the 1970's is famous for painting urbane subjects in traditional painting techniques.[9] The subjects of his paintings included the American flag, targets, and letters and numerals. These banal, urbane subjects lend little to the visual attractiveness of the piece but are the vehicle for testing different modes of painting and visual representation. John's practice of repetition and iteration is a diligent effort that creates many works of which "things the mind already knows"[10] Each time he created a piece of work in a series there were small changes made and a slightly different result emerged. The number five looks different when painted in monochrome than color, the edges become more or less defined and a new piece is created but with the same subject matter. The commentary centers on the ubiquity of the everyday, we become the things that surround us. If the things that surround us have lost any identity and there is no effort to renew the identity of the everyday, what are we saying about ourselves?

Having the ability and the experience of building is essential for some designers to create good design. Building manually creates a bond between design and architect and instills more humanity in the project. The process of design build is often something of trial and error, as the materials and drawing are not equal, this is valuable experience towards being able to design at a full scale without making those errors.

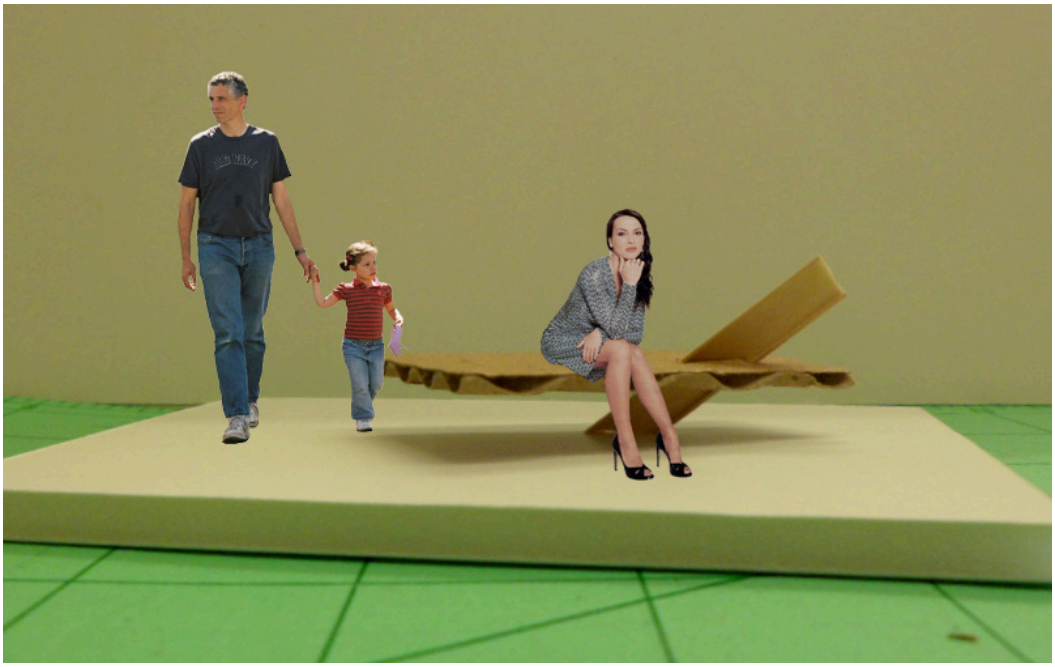
Exercises in Wood

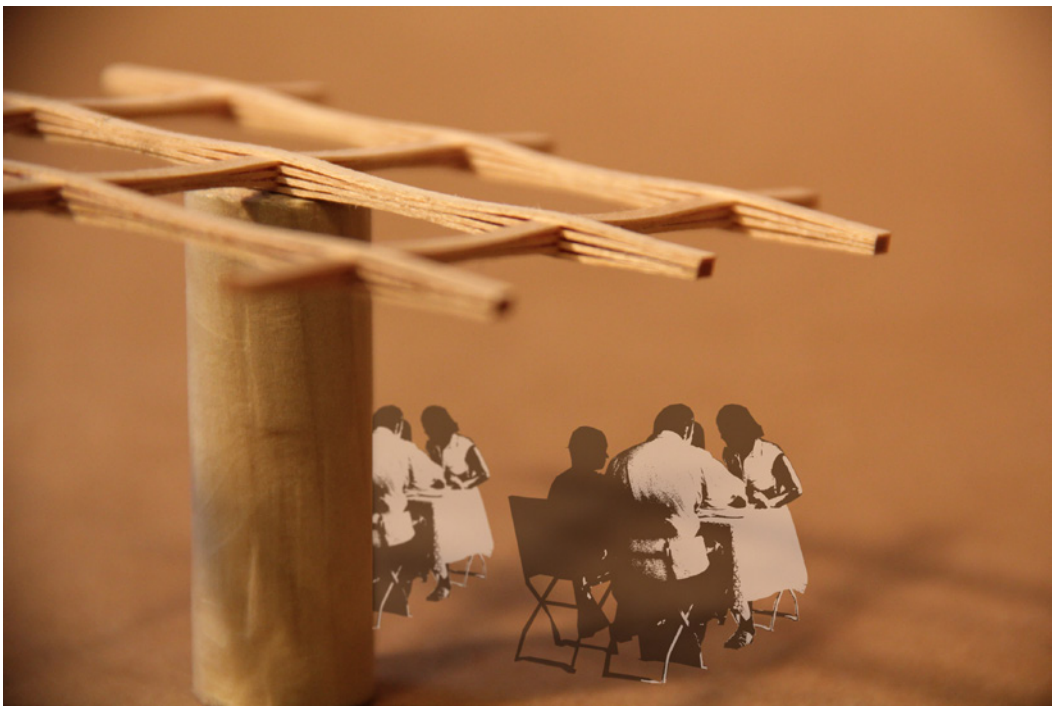
One of the first steps in crafting this process was to build models without a presupposition about use or program. These models served as vehicles to explore ideas of material use rather than using a material to define an end goal. Materials are not the means to an end; they are instead the final product. So by discarding the pretense of creating a thing, one can strip away the ideas that are foreign to manipulating the material. That thought process allows a rigorous material study.



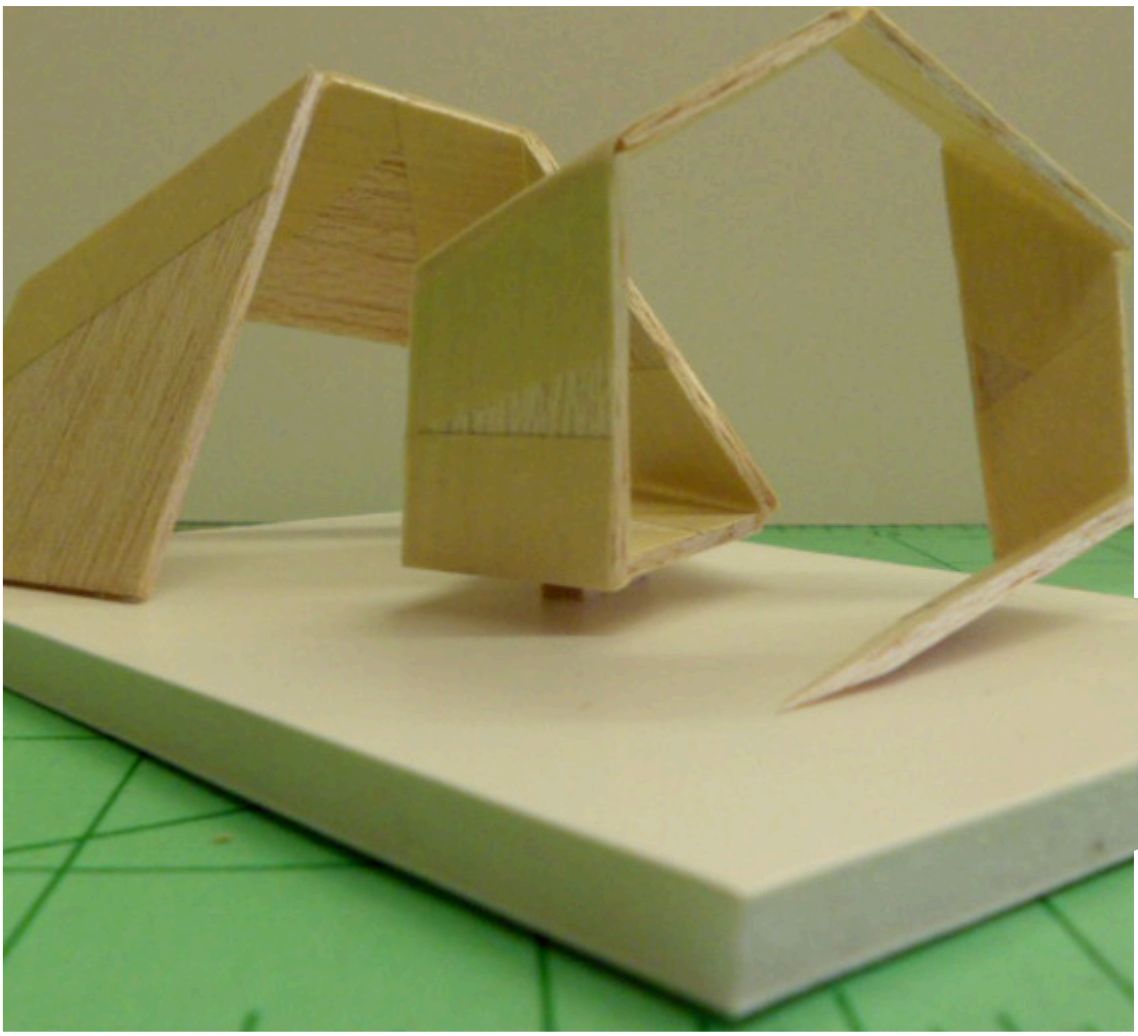


This is how the woven laminate structure came about. I made a fine grid of wood sticks that appear woven at the node points at the intersections of the members. At this point, I had created a very promising model with which I could build a convincing thesis on.

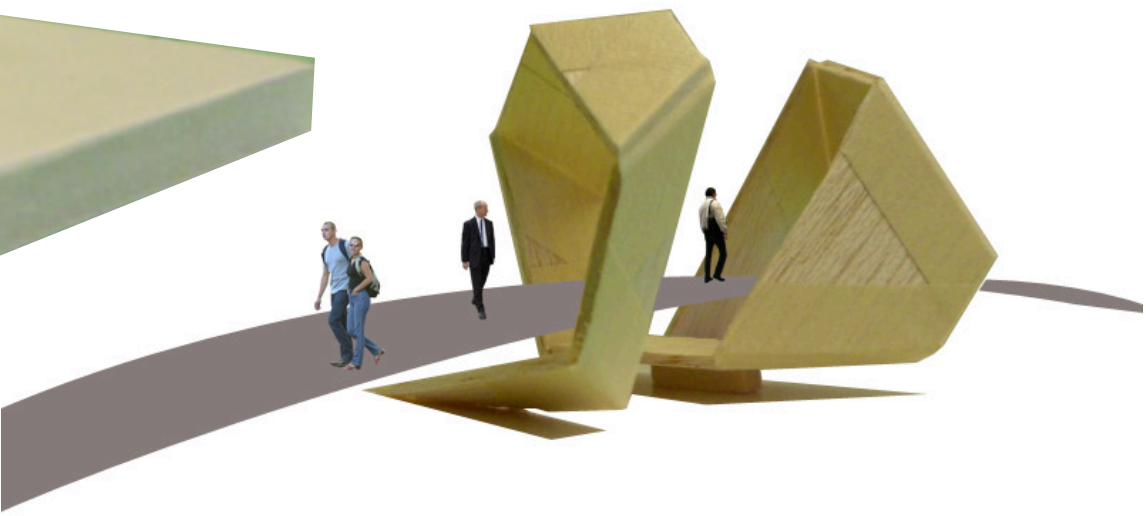




This series of digital alterations was performed on figure 1. The purpose of creating these conceptual sketches was to spark some critical thought about the idea of scale. In this case, the piece was created without scale, at least not as a model. The scale is meant to be full scale as an exercise in creating somewhat complex forms rendered in balsa wood. Adding program and scale digitally allowed a bit of freedom to envision this shape in different contexts. The two programs here are vastly different in size, one, a bus stop,



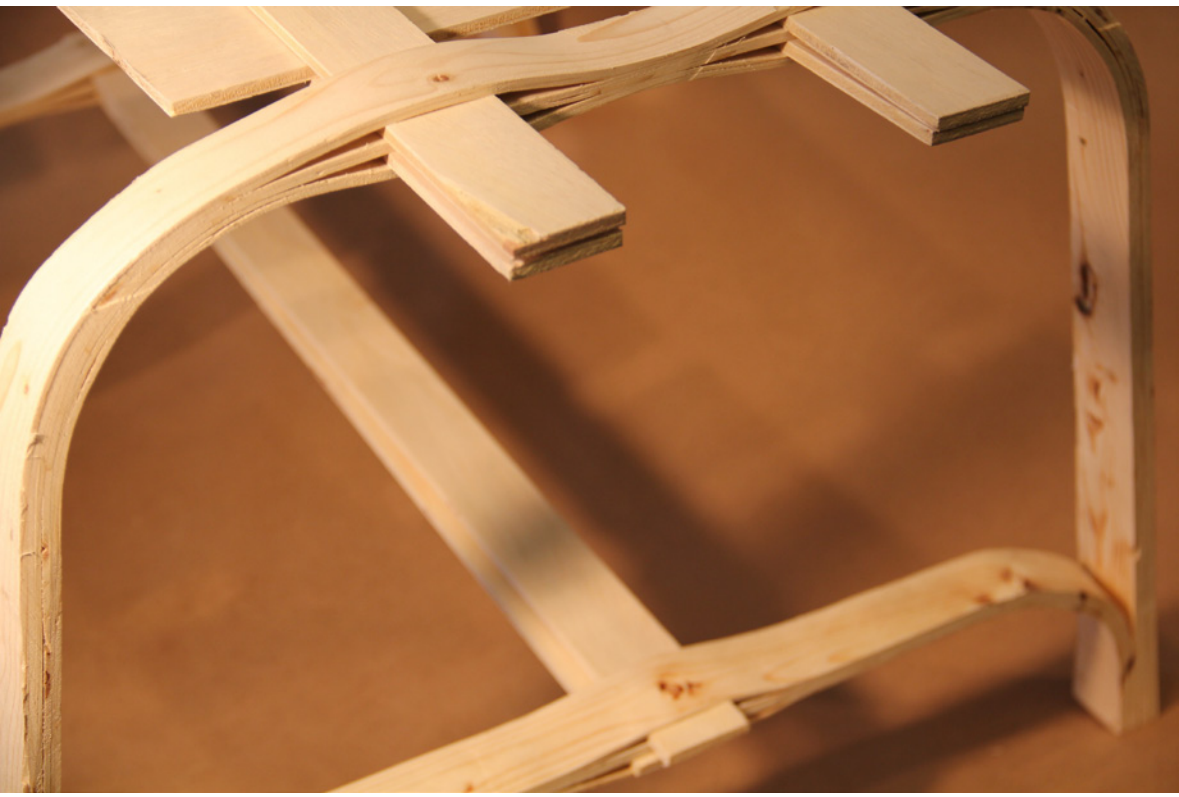
the other a pedestrian bridge. The folded plate design is suggestive of shelter as a bus stop, with the material transmuting from roof to wall to seat. The bust stop should be fairly reasonable as a structure without and extraneous support. The pedestrian bridge configuration offers two spiraled arches with three points of contact with the ground. In order to make this structurally feasible, the material would have to be thickened and braced laterally to prevent twisting and uneven loading across the span of the footpath.



Experiments in Furniture

I chose three verbs, to **bend**, to **weave**, and to **laminate** as a theme for a series of models. The first series of models, which was created without program, included a glulam lattice. The lattice exhibits each of the three verbs in physical form, which brings up the question of scaling up the system.

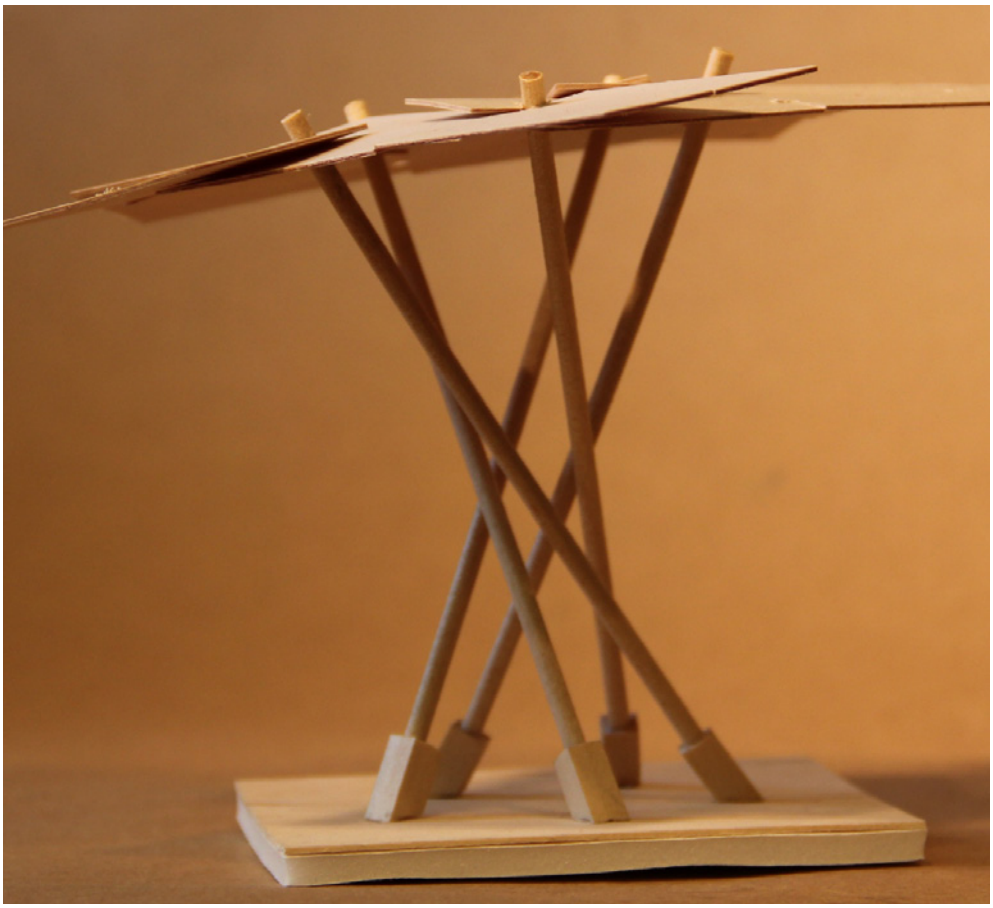
Furniture design and construction provides a proper balance between constructability, scale, and scope. It is important to design to the proportions of the human to provide resistance in durability and size. Functionality is contingent on the strength and precision of the wood bend and the accuracy

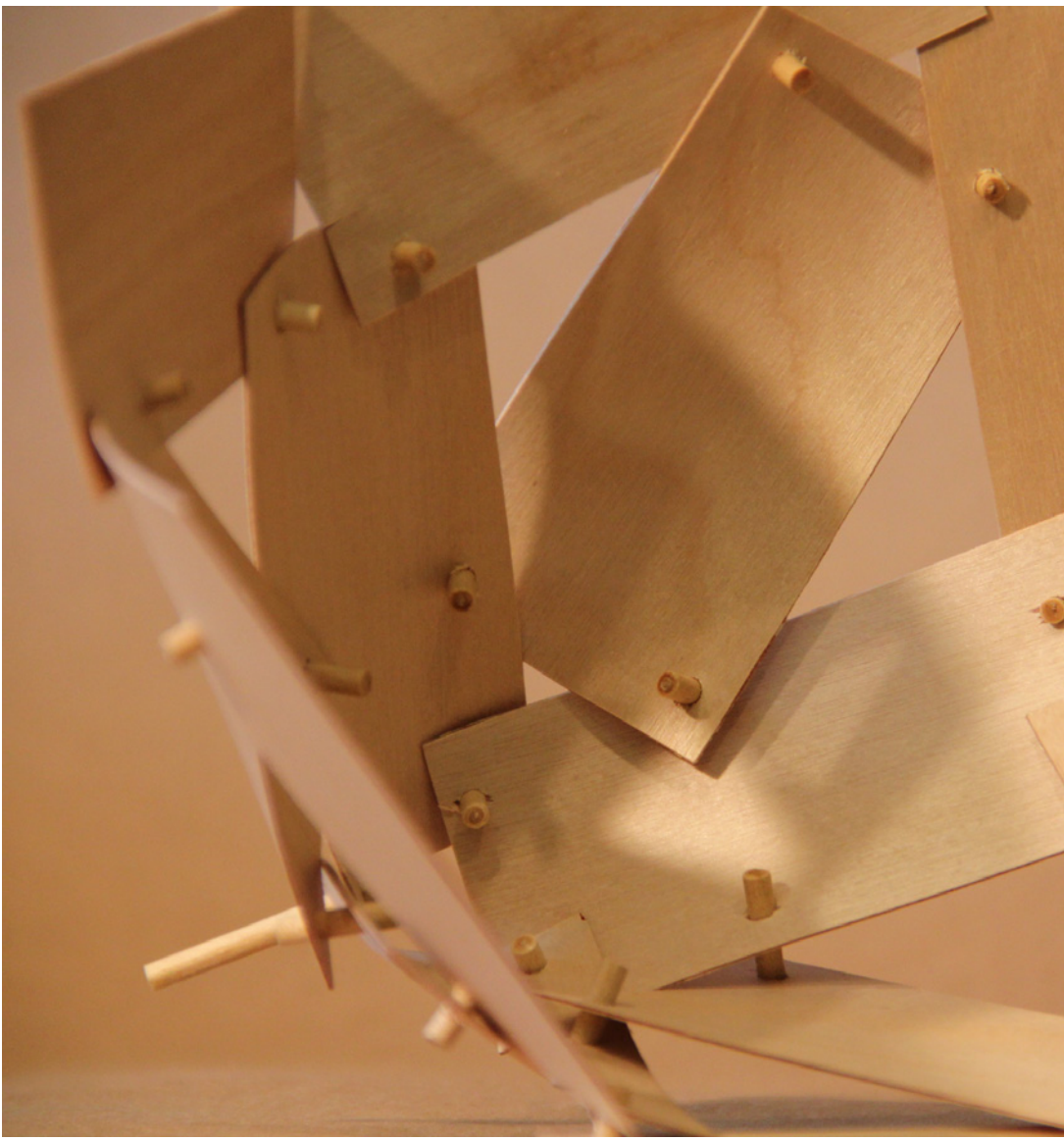


with which the wood is bent and laminated. It was important to attempt to create human scale pieces to learn those intricacies and determine the amount of skill required to make durable things. Unfortunately, the furniture design was, ultimately, a failure, as the chair did not hold up to the weight of a human. However, the process of steaming, bending, and laminating the wood was successful in regards to gaining competency in the properties of bending wood. In the two pieces created, the nodes at which the members connected were woven, while the joints between leg and side were bent and laminated.

Module Exercises

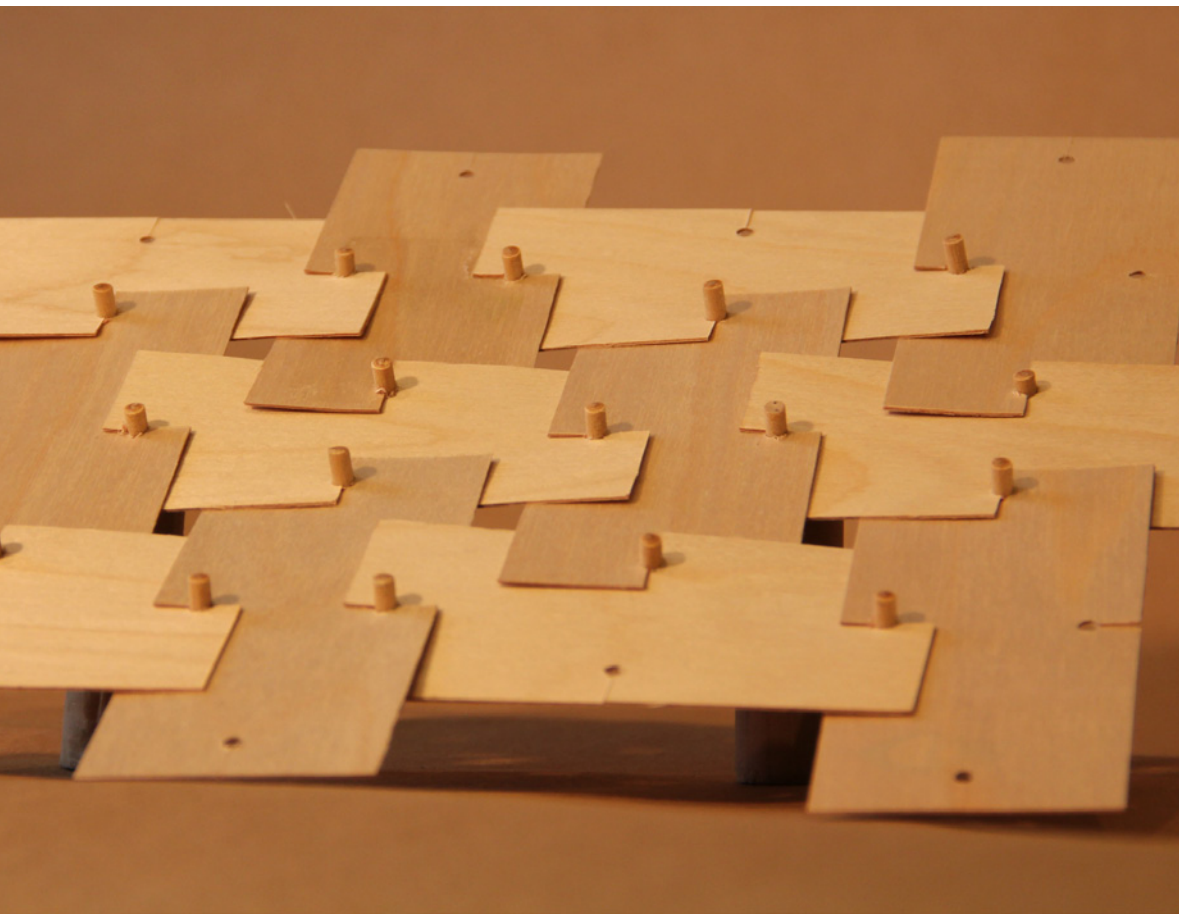
Each of the experiments and exercises shown here follows a defined set of rules in order to achieve the most rigorous results. This represents the first of the module exercises, wherein the module is the 4x8 sheet of plywood, and mechanical fasteners and not allowed. The task is to create shelter using the module, and the three verbs to **bend**, to **weave**, and to **laminate.**

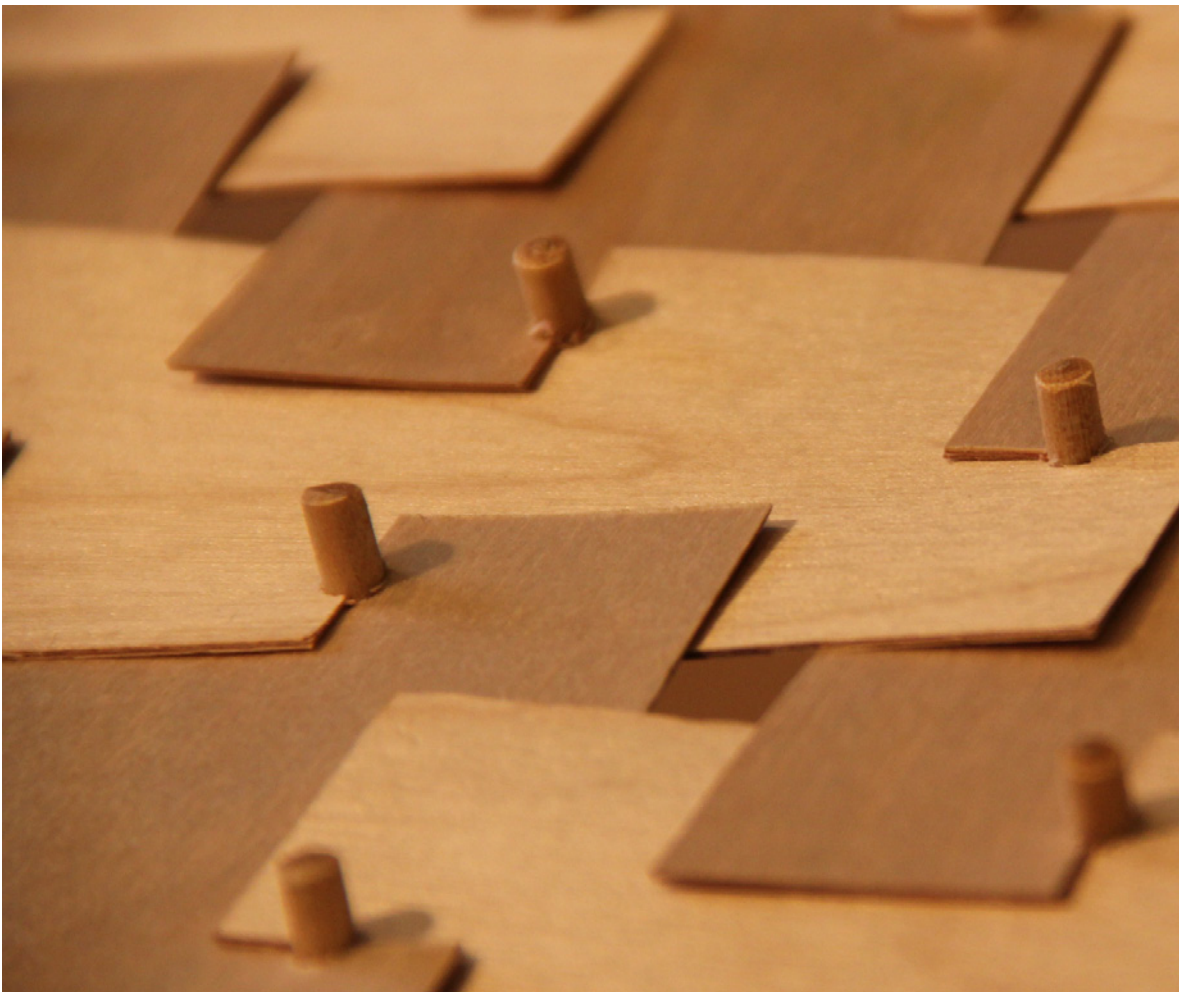


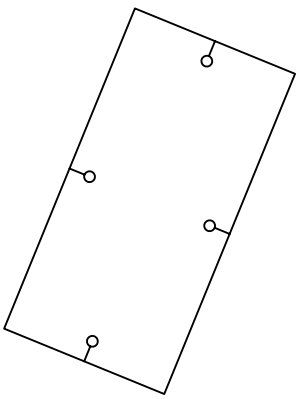


Module Exercises II

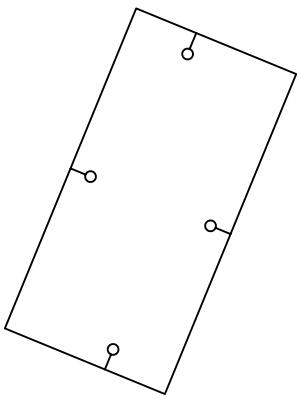
This represents the further refinement of the modular system. In addition to the rules of the 4x8 unit and no mechanical fasteners, the punctures in the module are now regulated. This introduces predictability into the system. With 4 regularly spaced holes and connections, the resulting form will remain flat. With 2 connection points offset a gently curving form results With all 4 holes offset the form will again be flat.



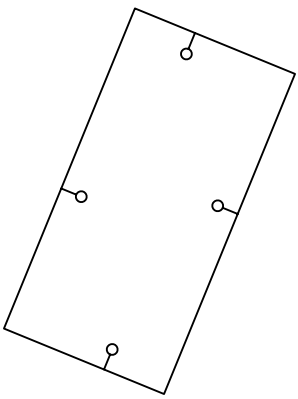




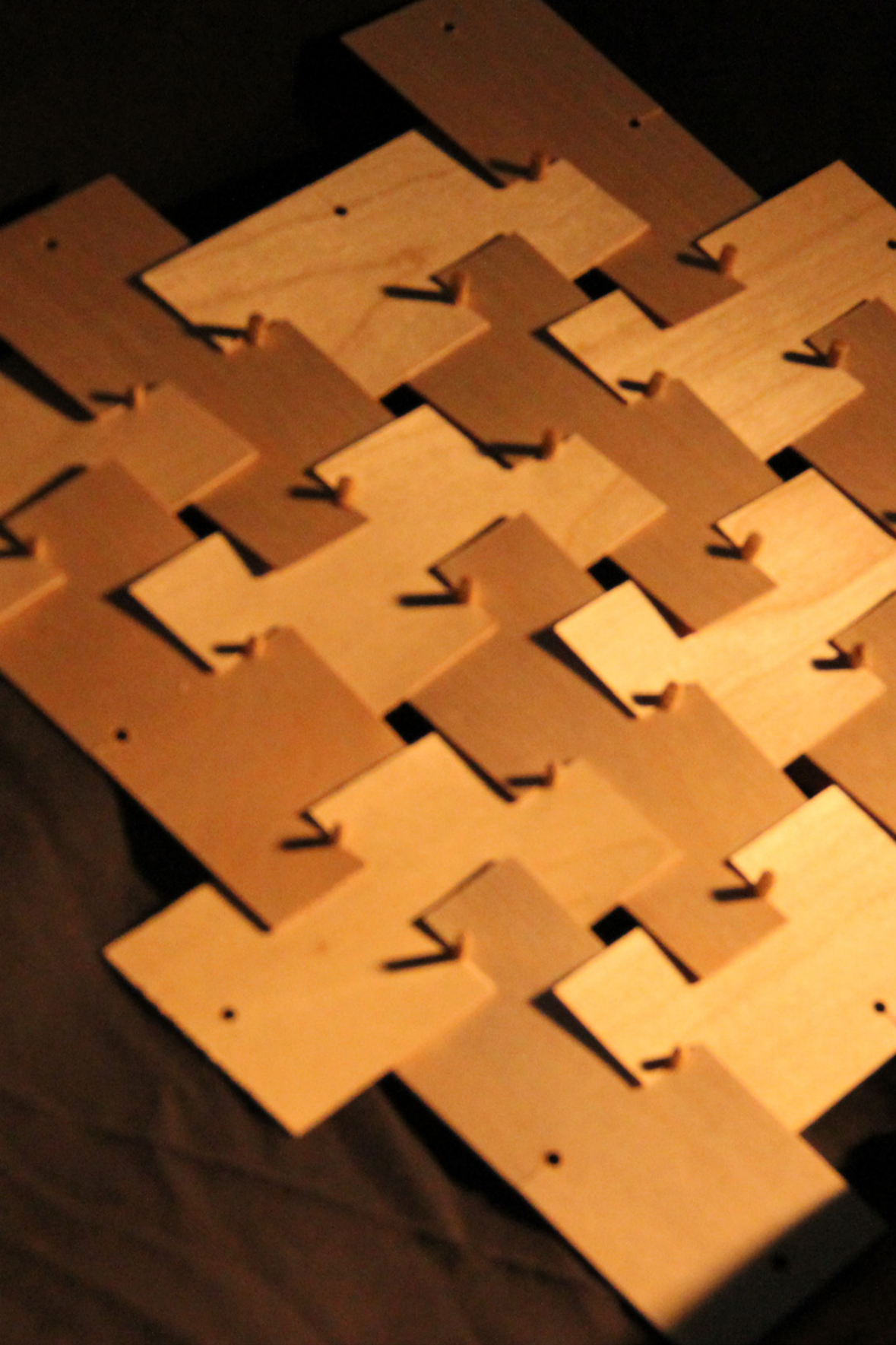
Uniform

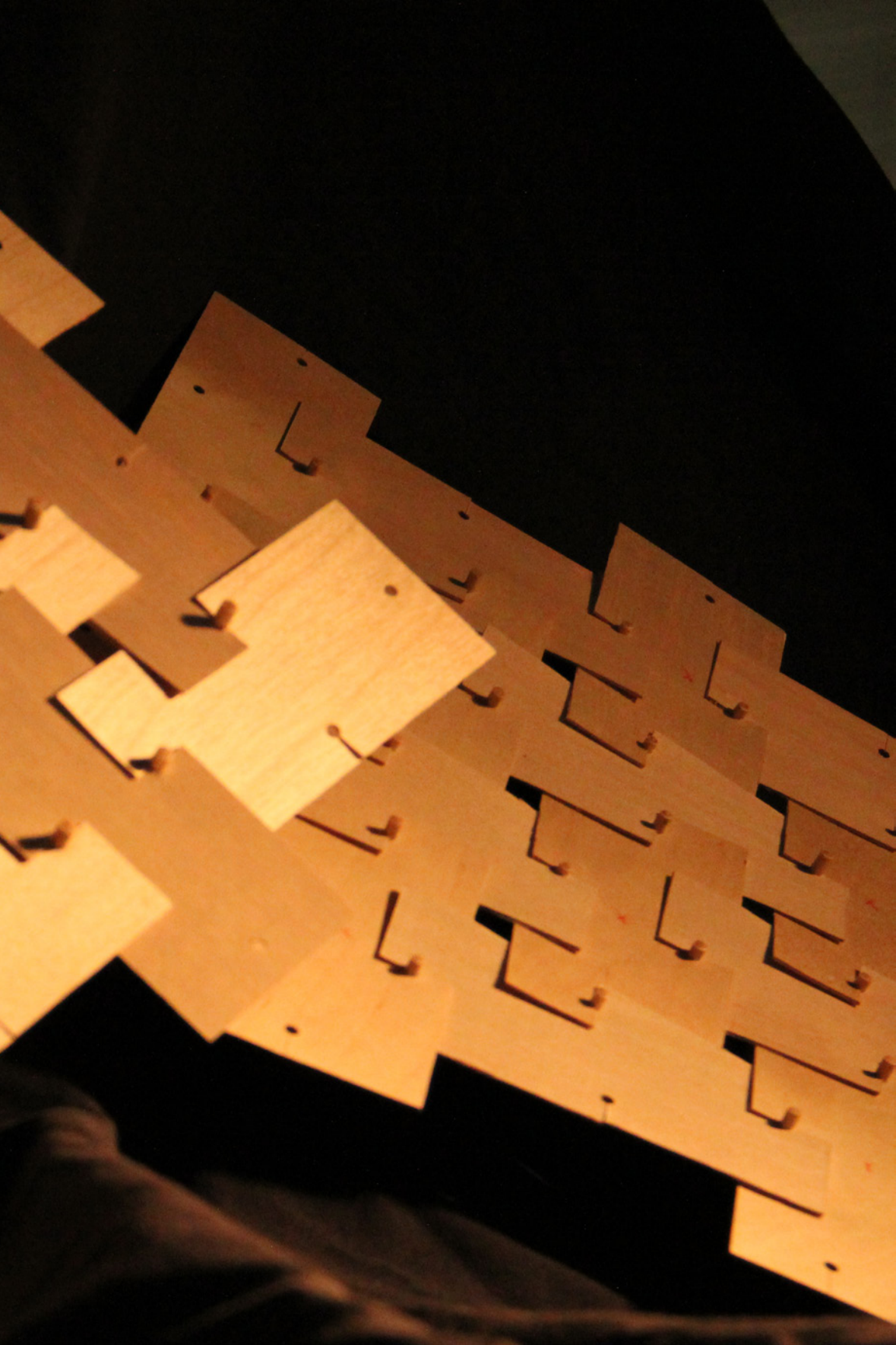


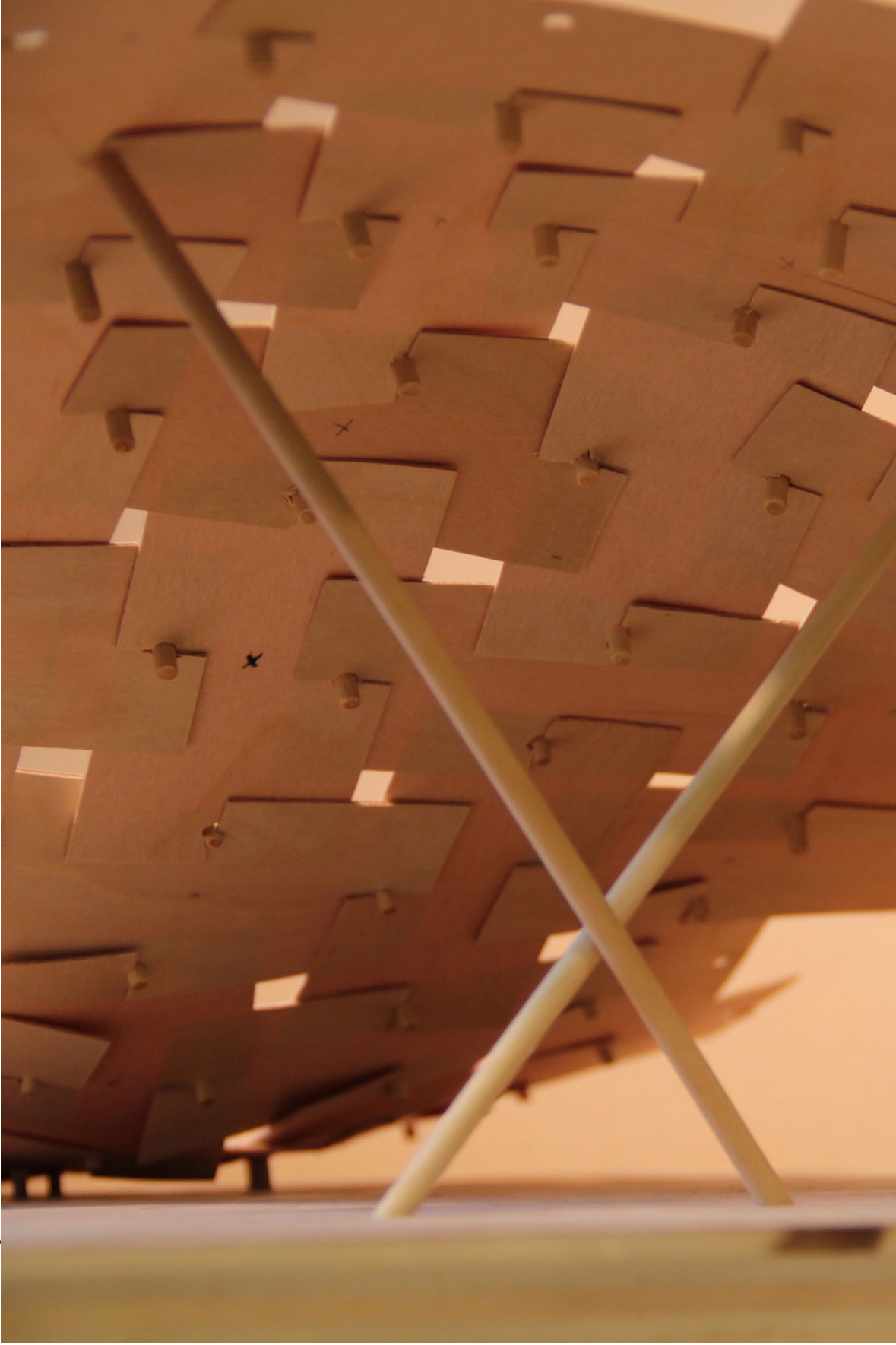
Long axis offset

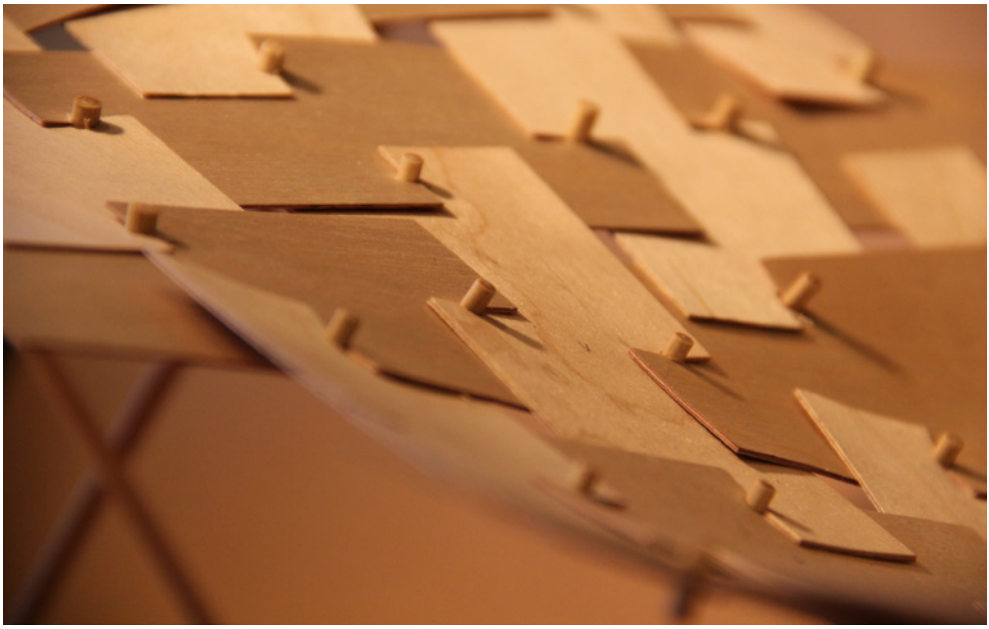


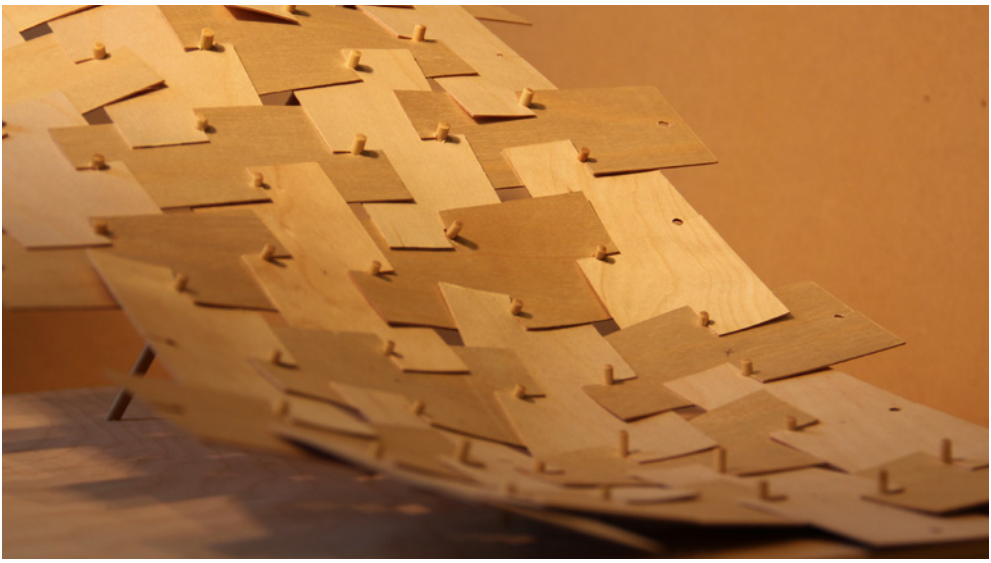
All offset









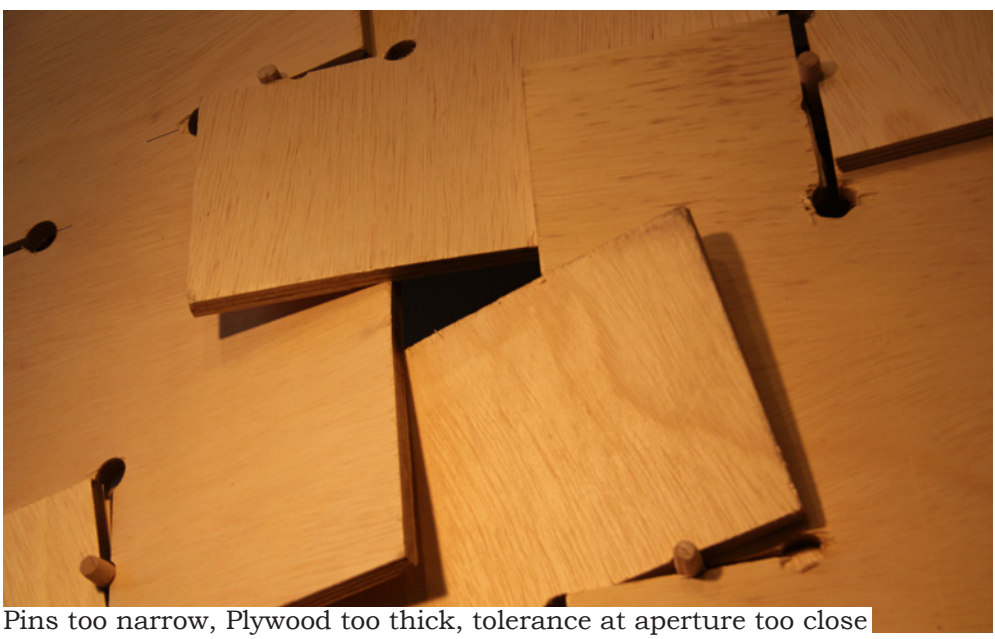


This model is the conclusion of the scale experiments for this module. One of the tenets of my work is to experiment with the full scale. What follows are several attempts at scaling this module up. I discovered strength is directly related to the depth to surface area of the individual module. The scale model has a higher depth to surface area ratio (.003) than the full scale model (.0008) which is a factor of 4.5 or a 450% advantage. In order to achieve the same depth to surface area ratio, the modules would need to be constructed from 1 1/8" birch plywood.

Full Scale Experiments

Pins too small, failed in surface tension

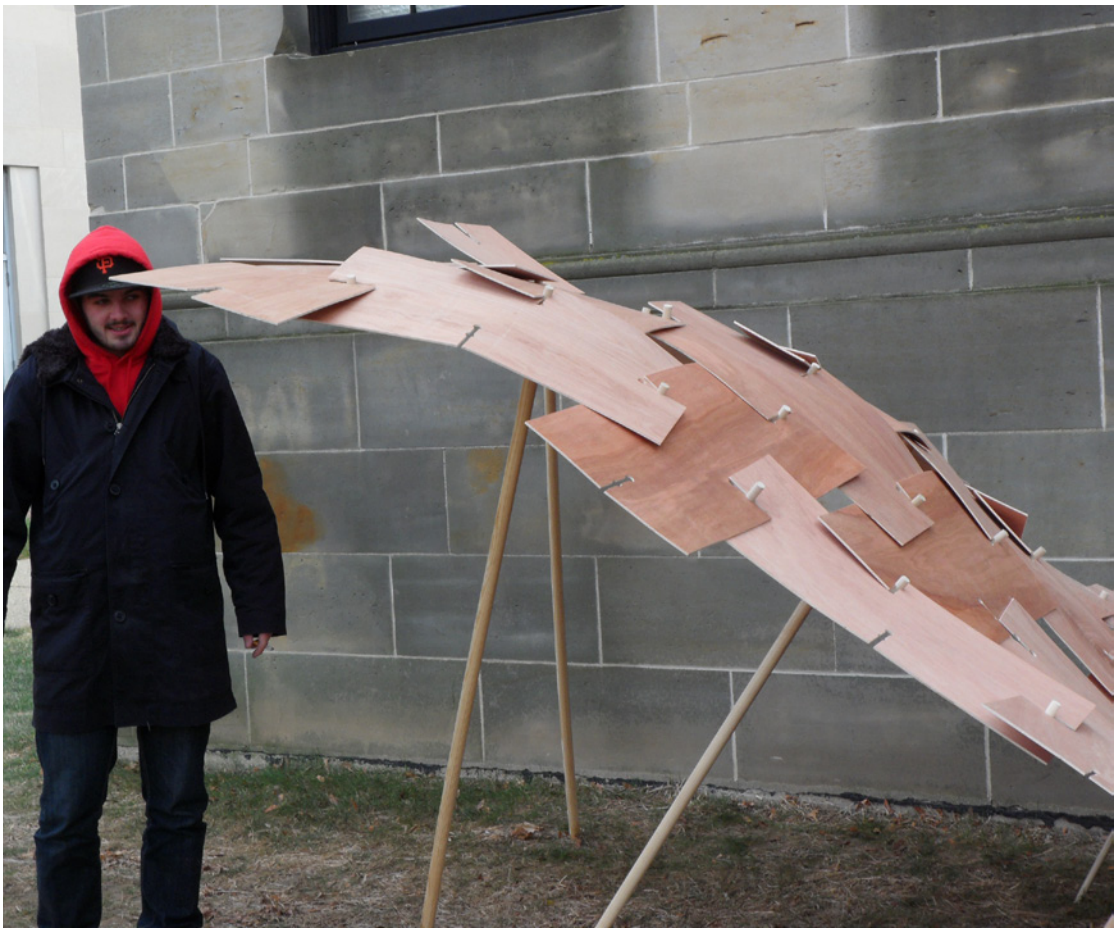
This is the point in the process when it was appropriate to build a full scale shelter. Shown on this page are the mock ups that failed in one fashion or another. The model shown on the previous page is at a scale of 1:12, at that scale 1/32" plywood does not require much provocation to stay in the air. Again at that scale the depth ratio is much higher then at full scale, even with the 1/2" plywood used at a unit size of 1'x2'. After trying three times to achieve the same curve found at the model scale, I found the right combination of 1/4" luan and 3/8" dowel rod pins, the shelter stood.

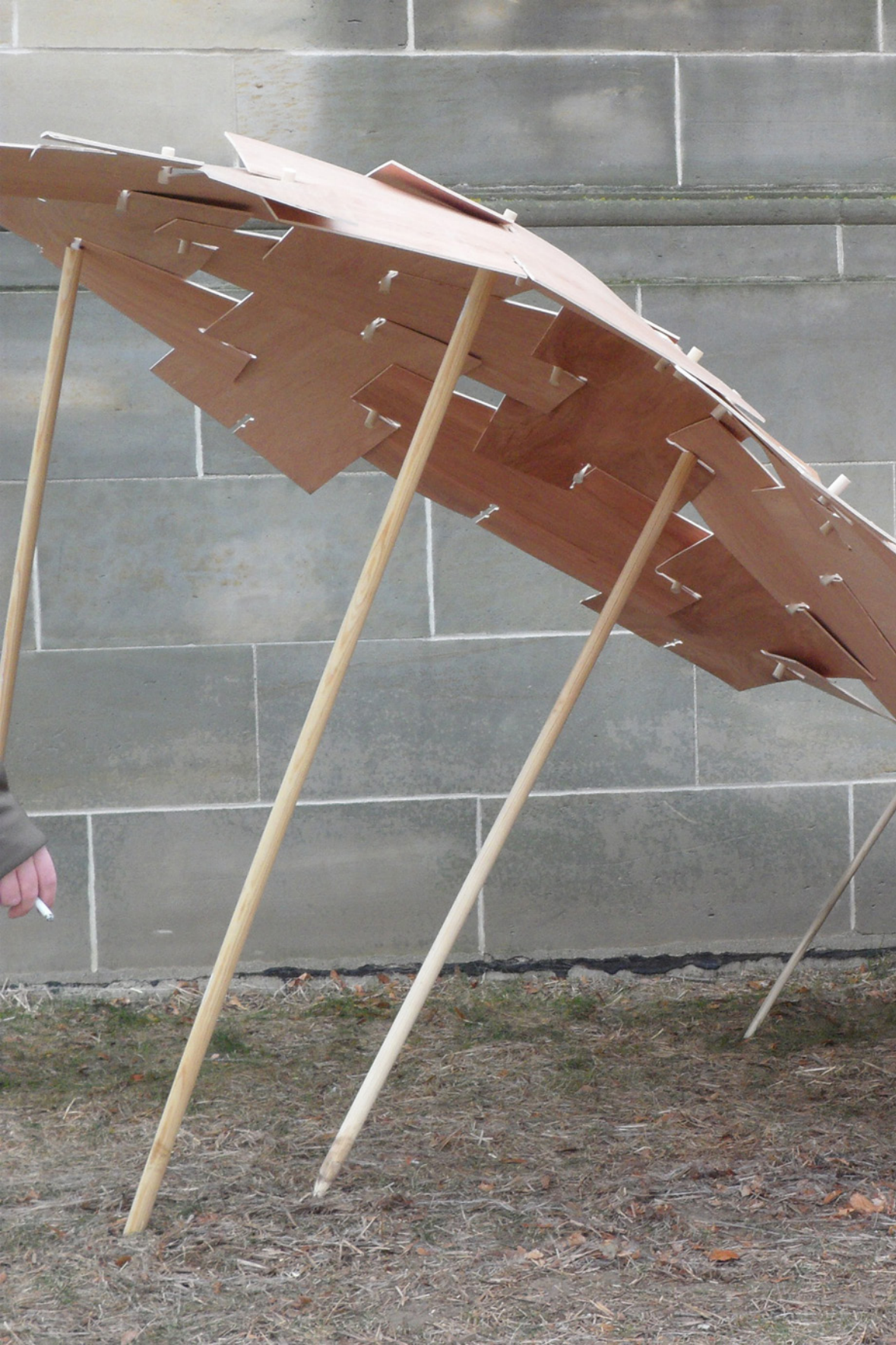


Pins too narrow, Plywood too thick, tolerance at aperture too close

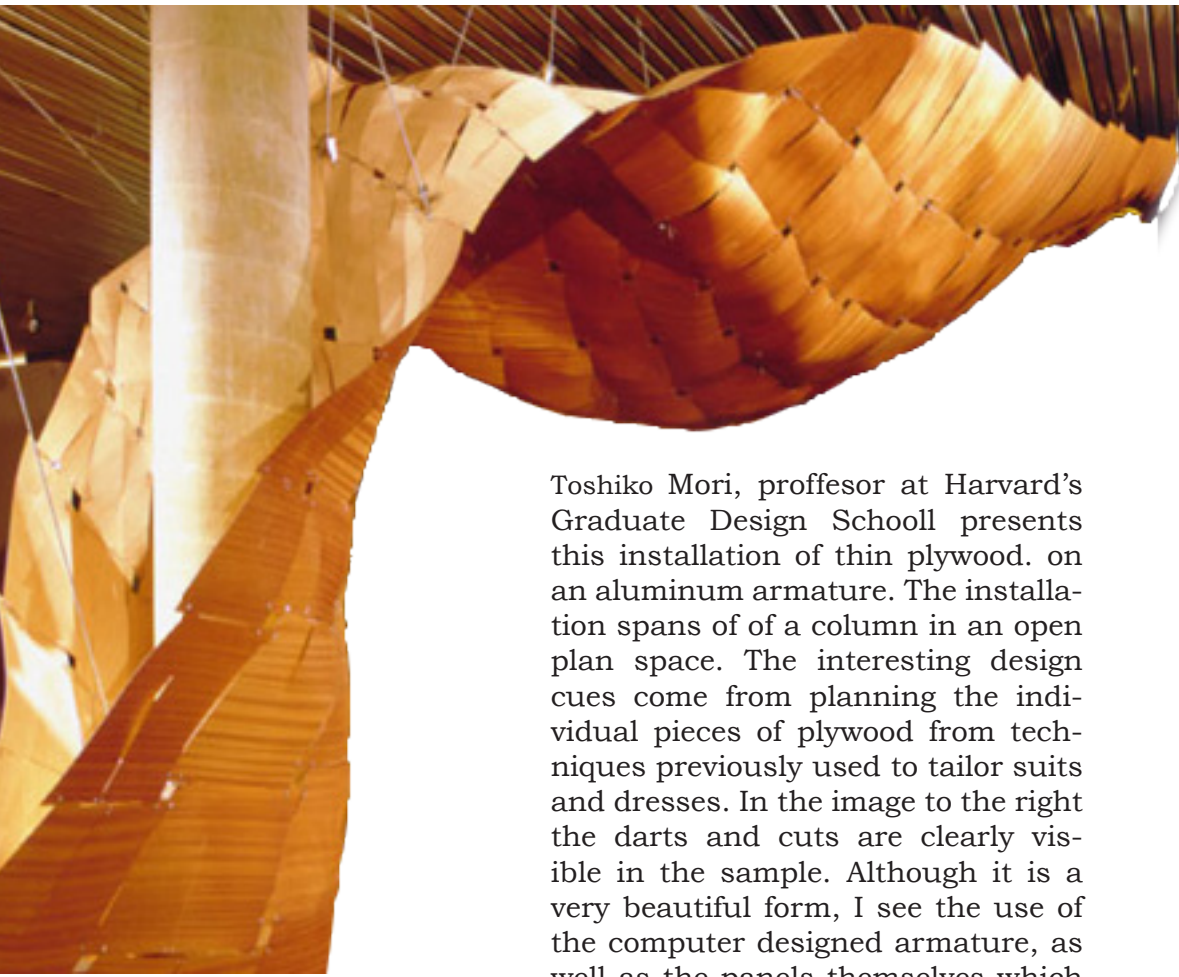
"Show me a thoroughly satisfied man -- and I will show you a failure."
-Thomas Edison

Pins appropriate, plywood too thick, aperture too small causing plywood to crush at bending moment

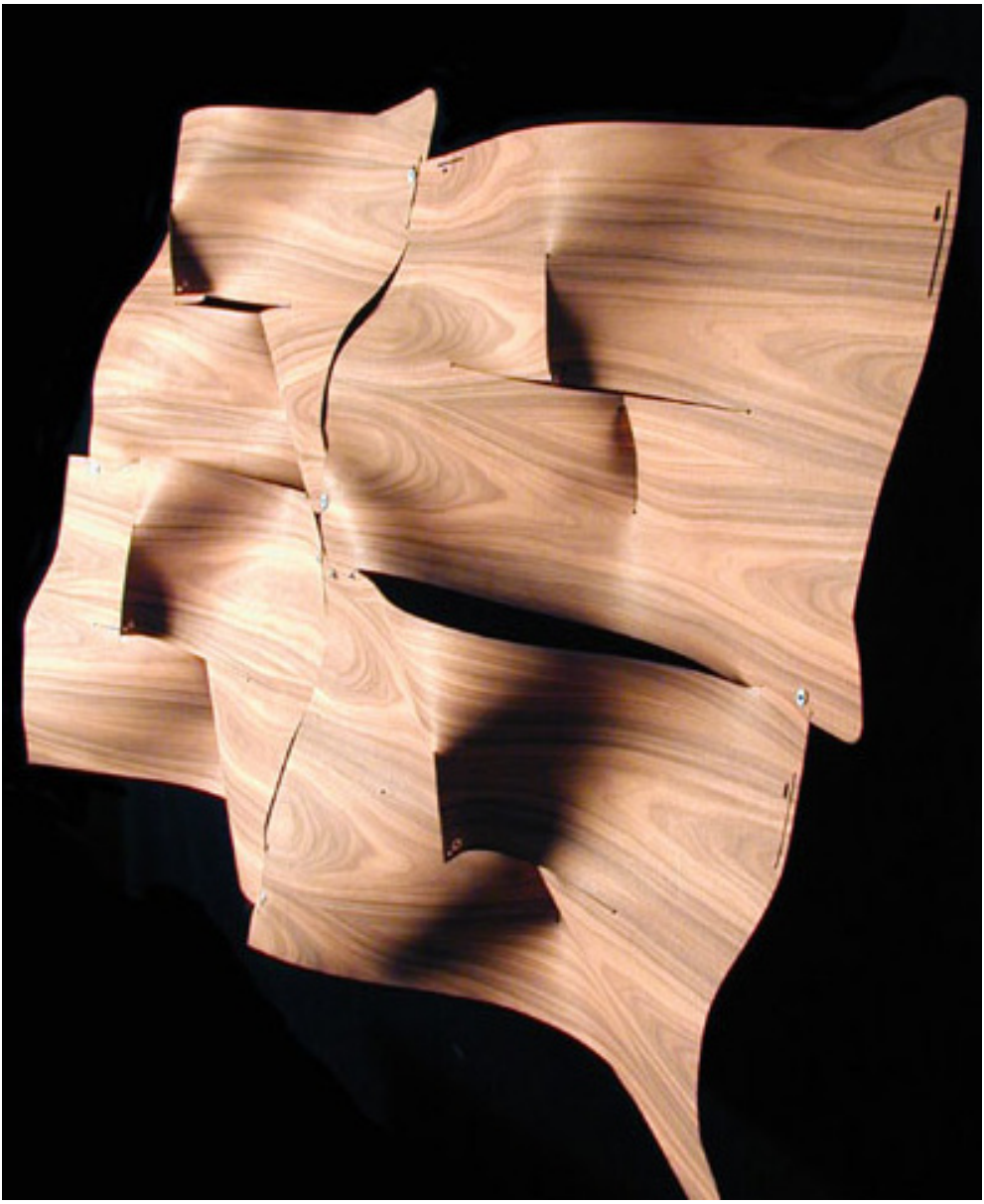




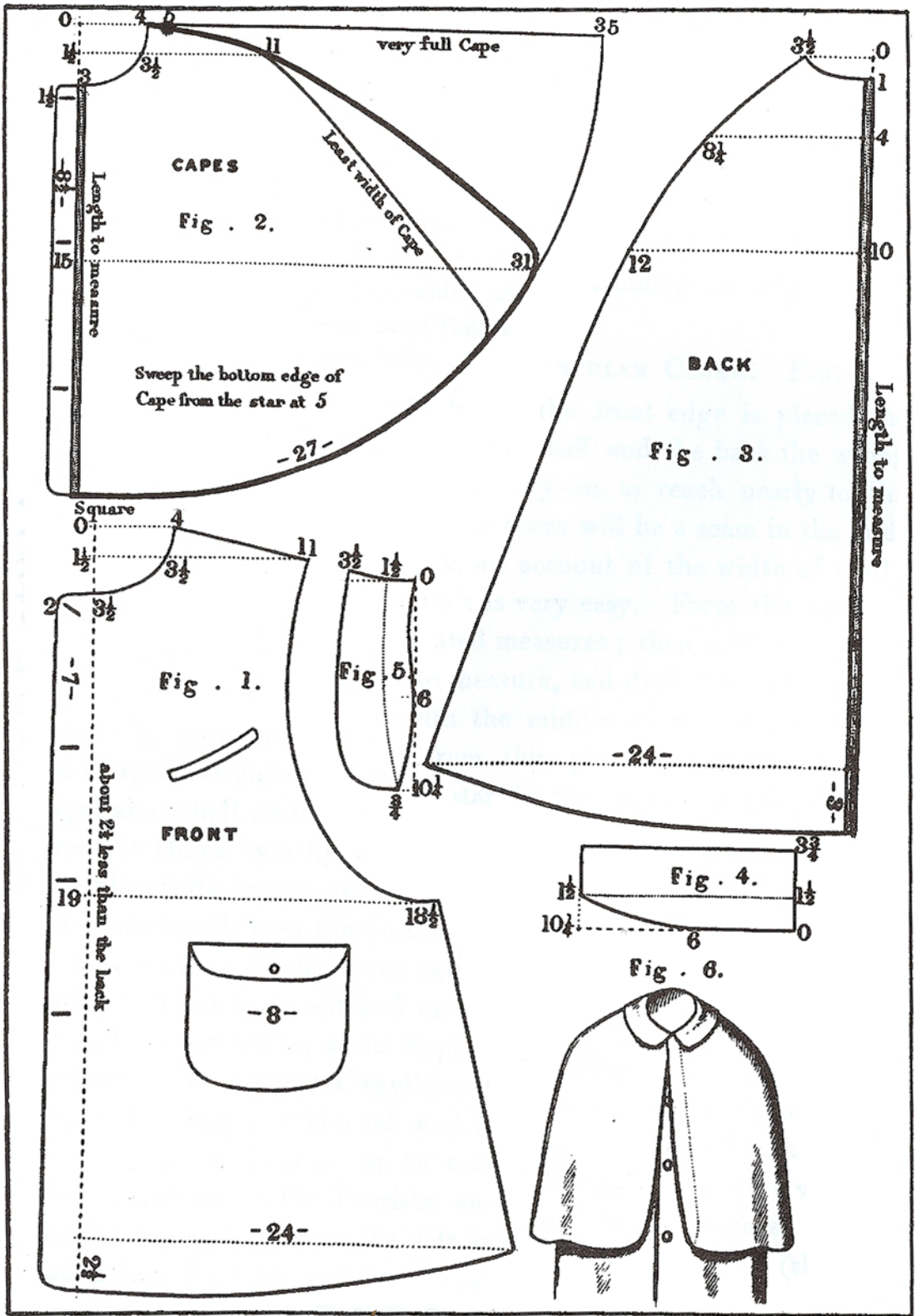
Precedent Research



Toshiko Mori, proffesor at Harvard's Graduate Design Schooll presents this installation of thin plywood. on an aluminum armature. The installation spans of of a column in an open plan space. The interesting design cues come from planning the individual pieces of plywood from techniques previously used to tailor suits and dresses. In the image to the right the darts and cuts are clearly visible in the sample. Although it is a very beautiful form, I see the use of the computer designed armature, as well as the panels themselves which seems rather artificial to the process.

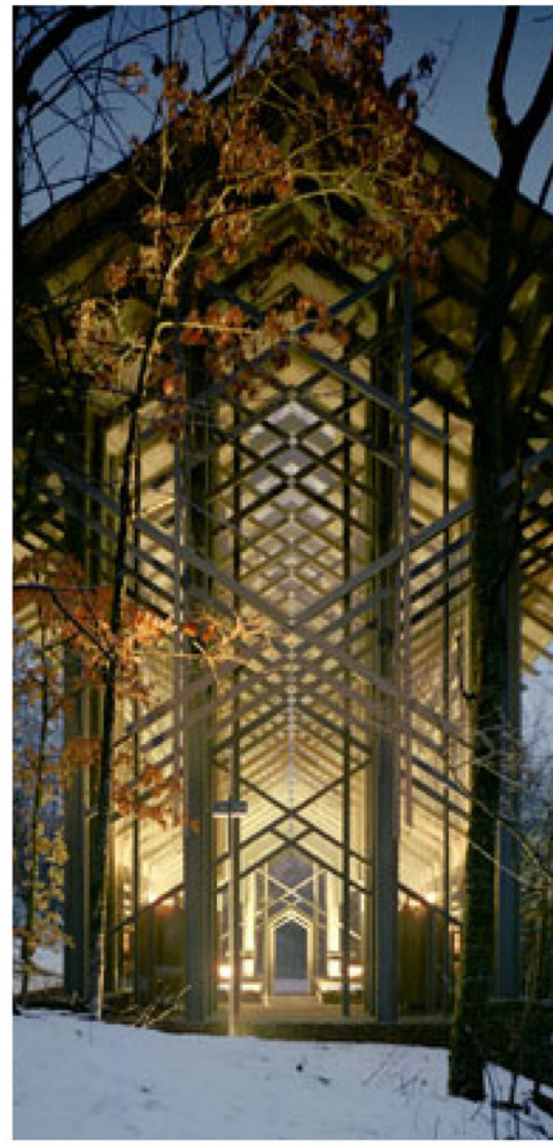


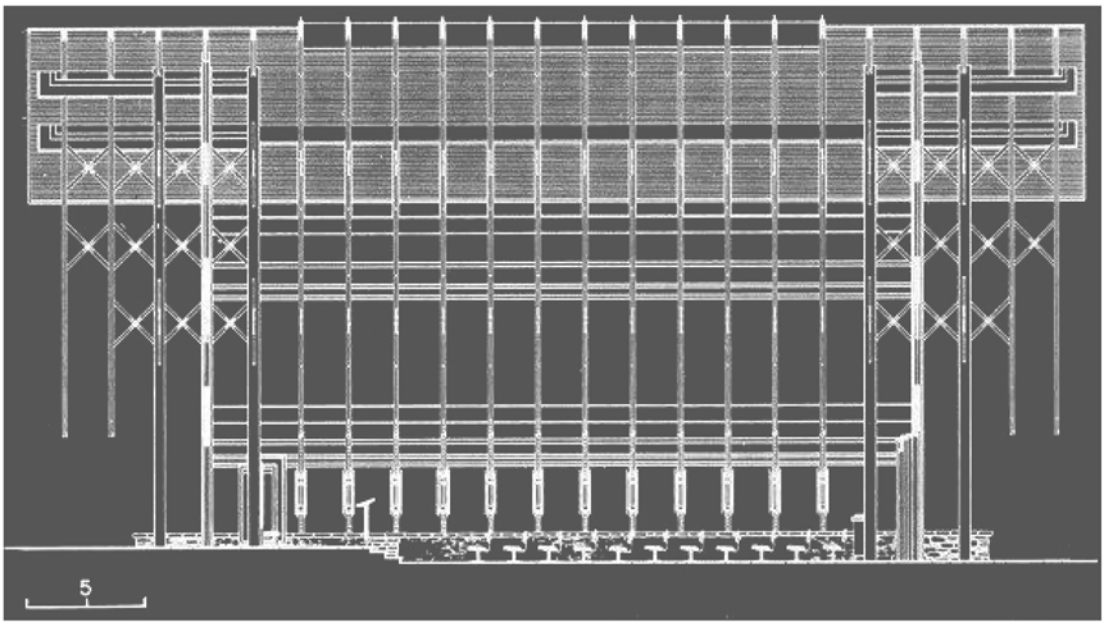
INVERNESS CAPES.



Thorncrown Chapel

E. Fay Jones' Thorncrown chapel in Eureka Springs Arkansas is an incredible structure situated in the foothills. The building is striking in it's simplicity, created from dimensional lumber painted a monochromatic steel gray. The exterior is clad in glass from floor to ceiling and the floor is a simple flag stone. Jones carefully orchestrated the procession to the entrance, taking full advantage of the slender height of the front elevation. The true beauty of the building is the web of structural members. Built with the accuracy of a cabinet maker, the 2x4 lengths of lumber lose all their weight in the softly lit interior. The detail that makes the building a bit mysterious is the use of repeated linear members in the ceiling to give the sense of something solid over-head. Thorncrown Chapel is a fantastic example of ethereal architecture made with the simplest of materials.

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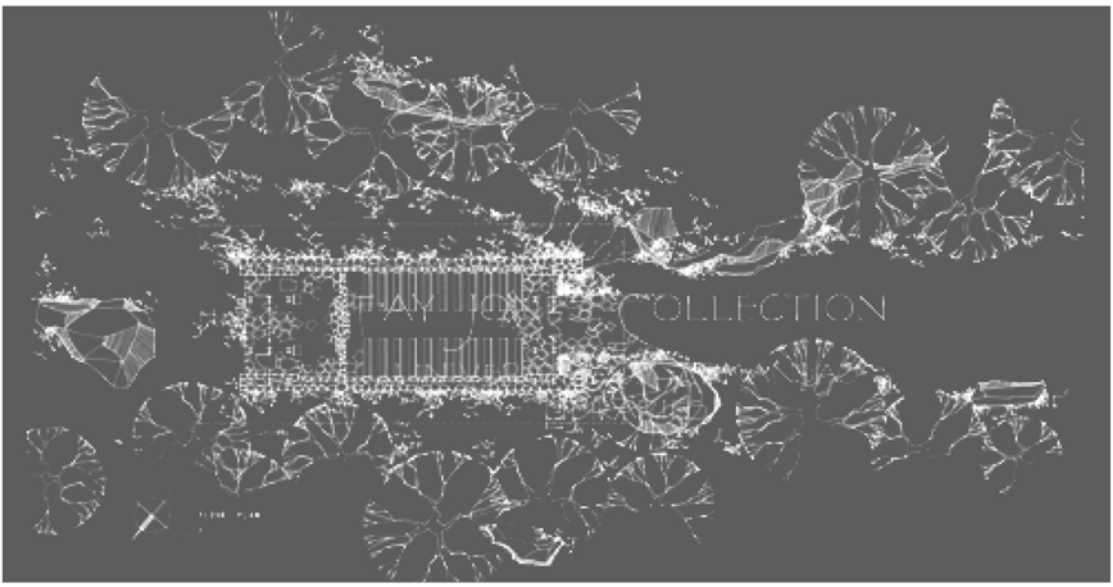
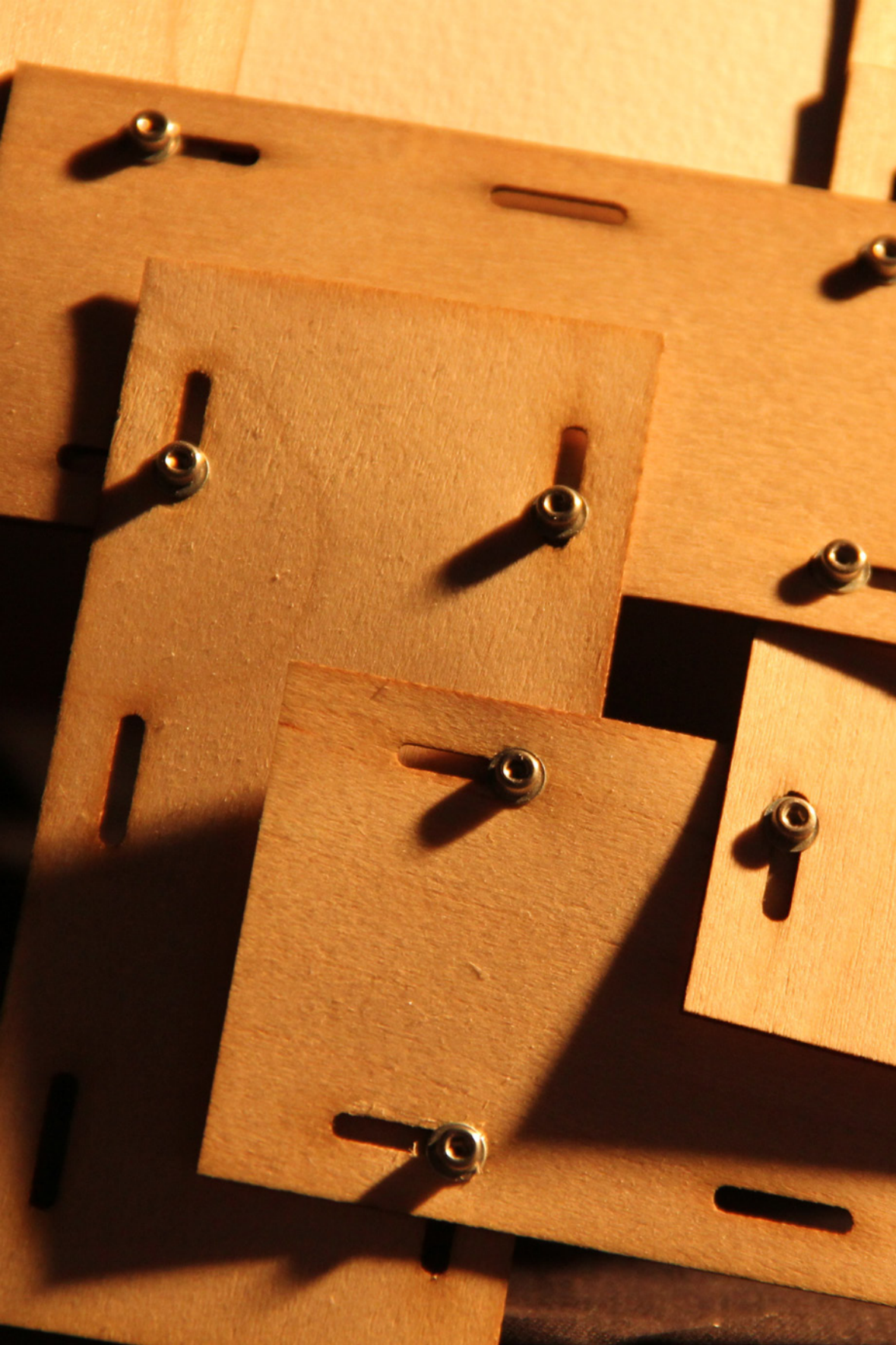
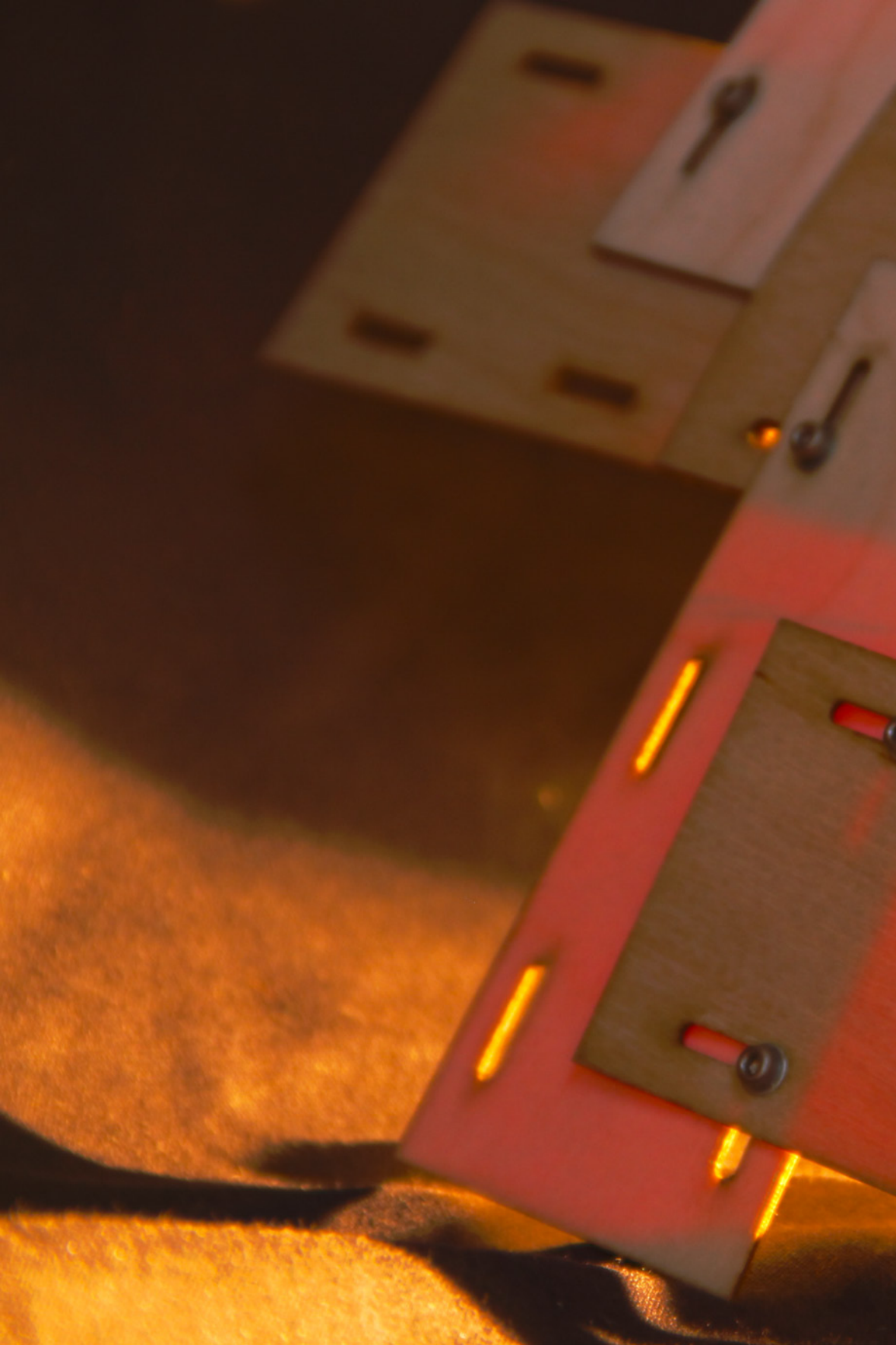
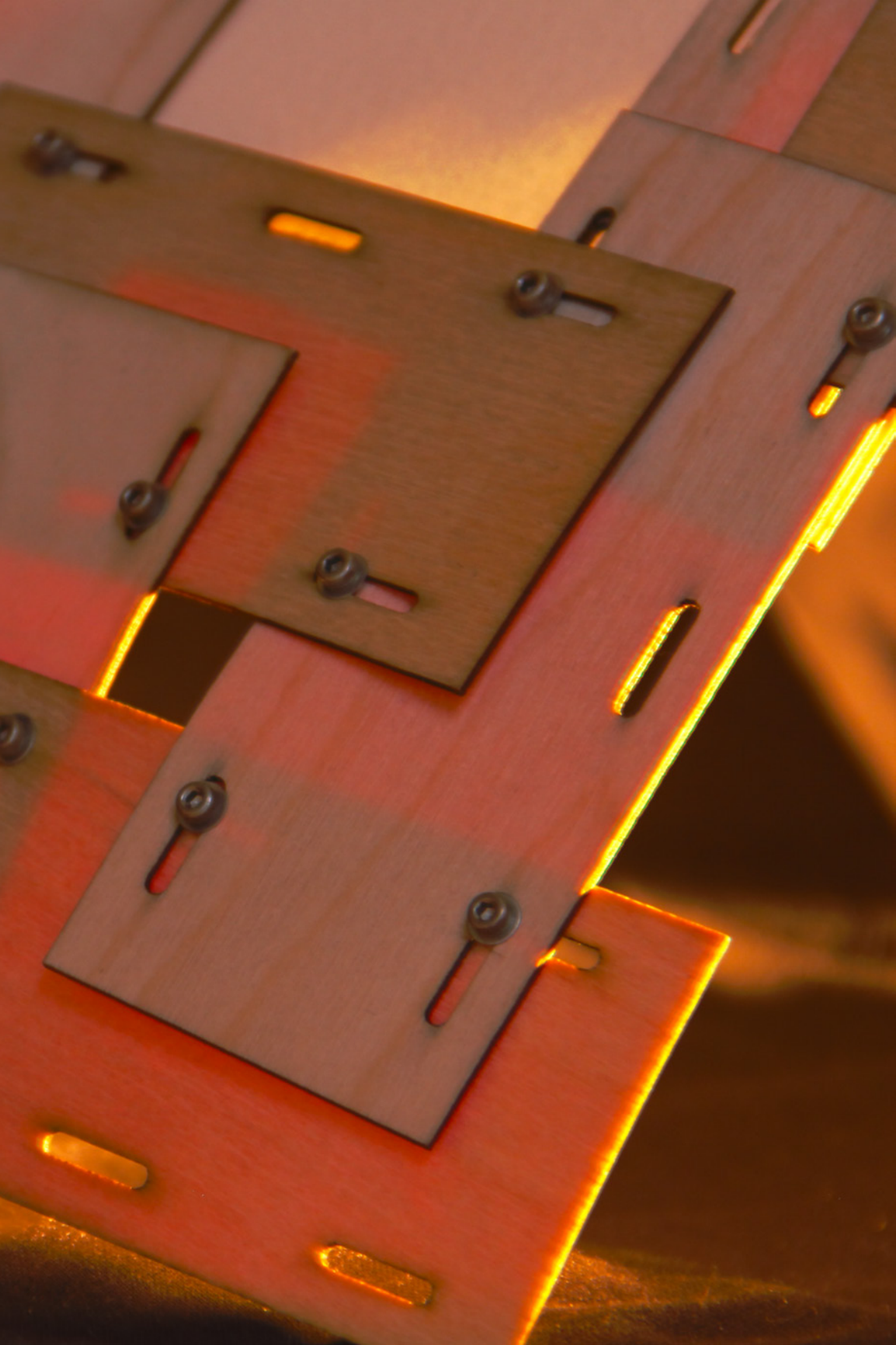
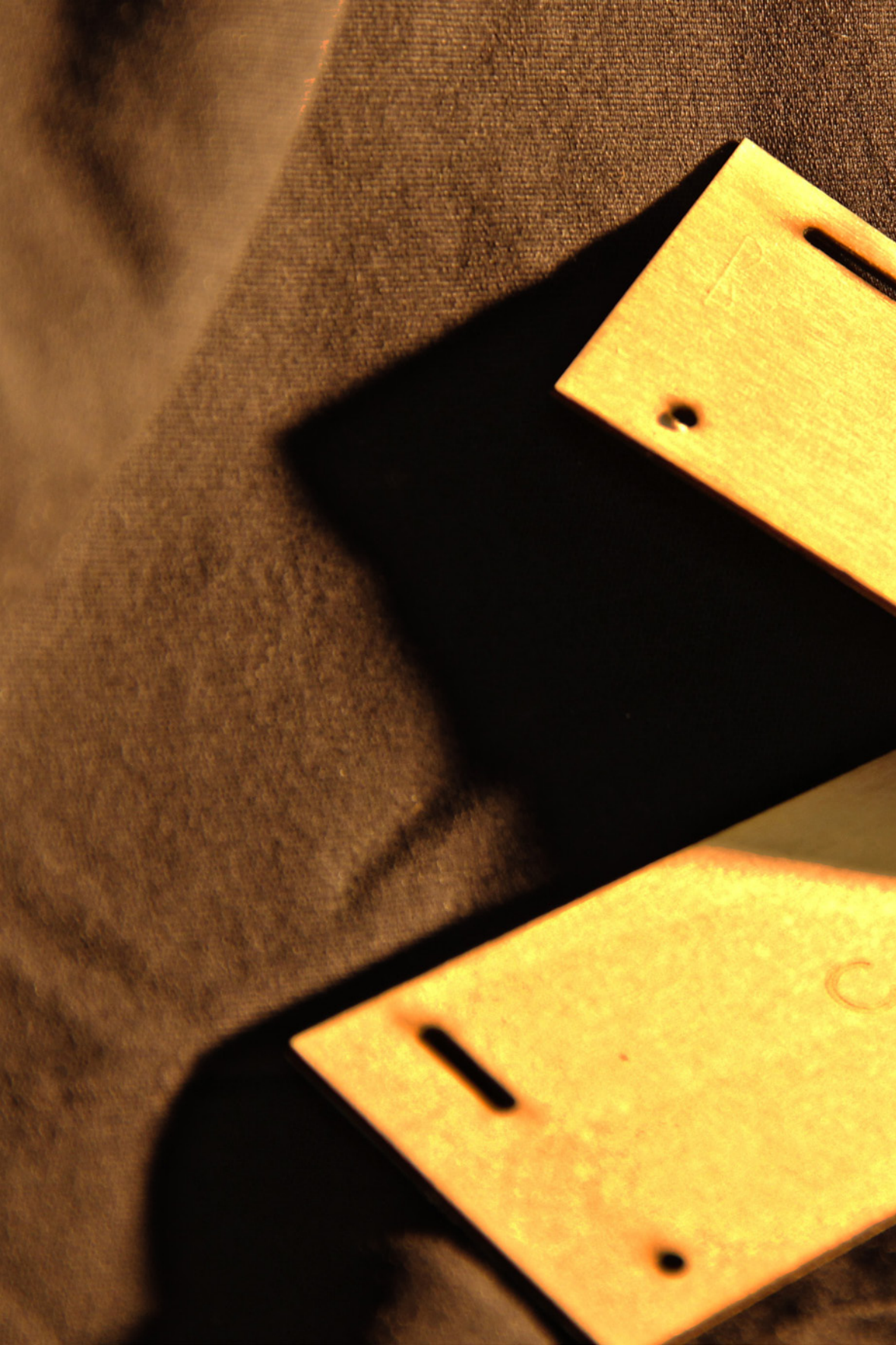

COLLECTION

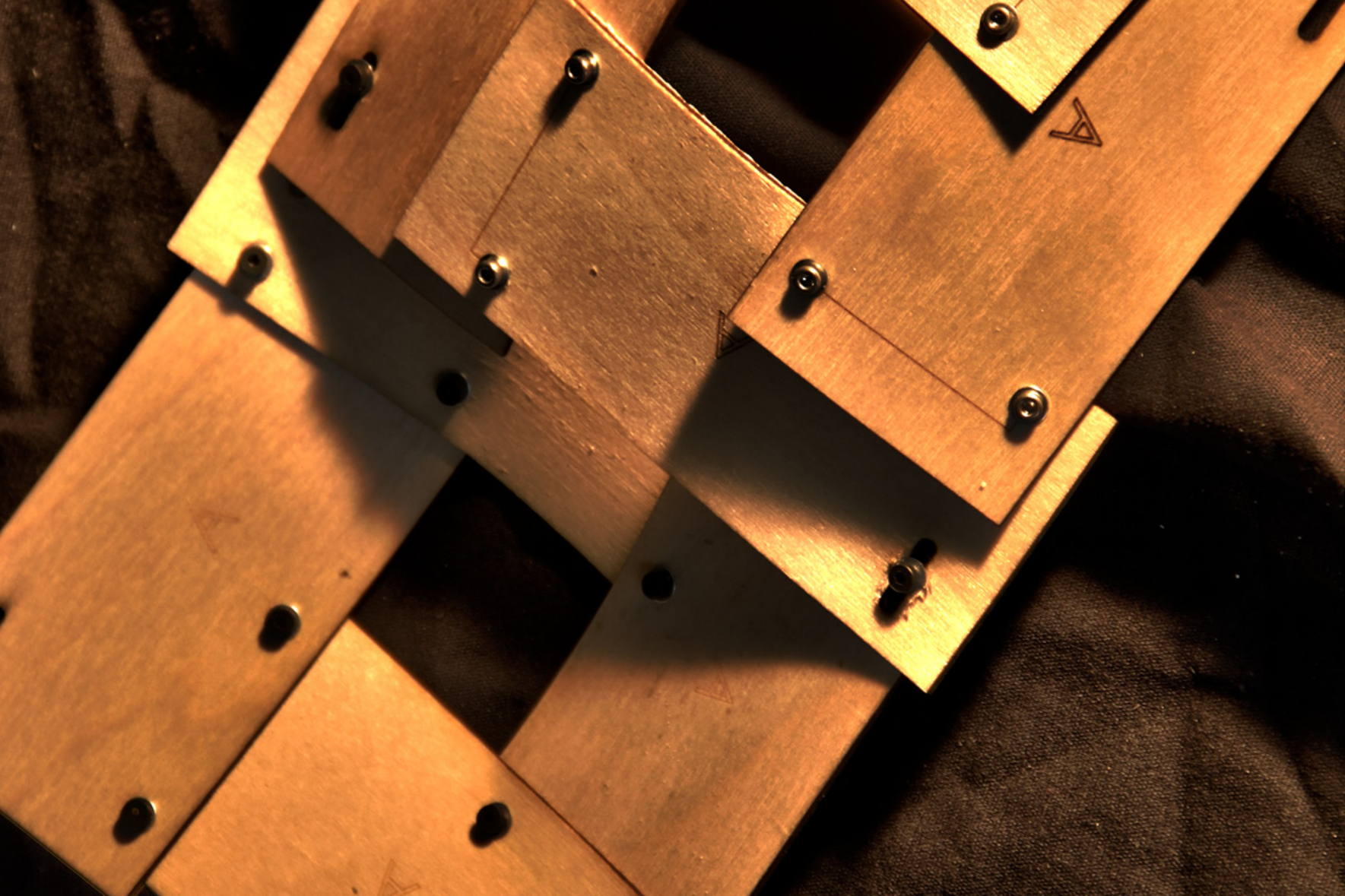


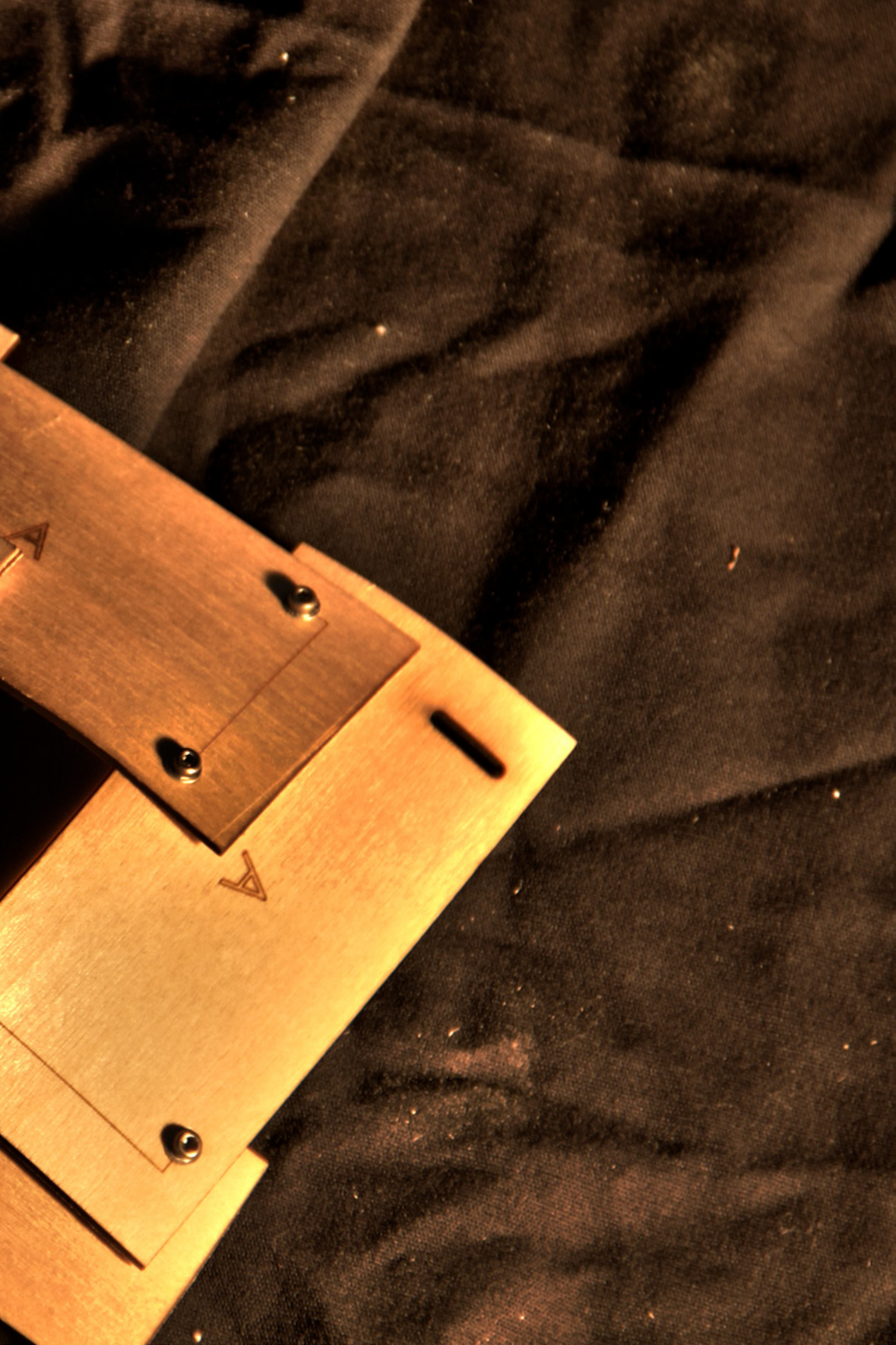


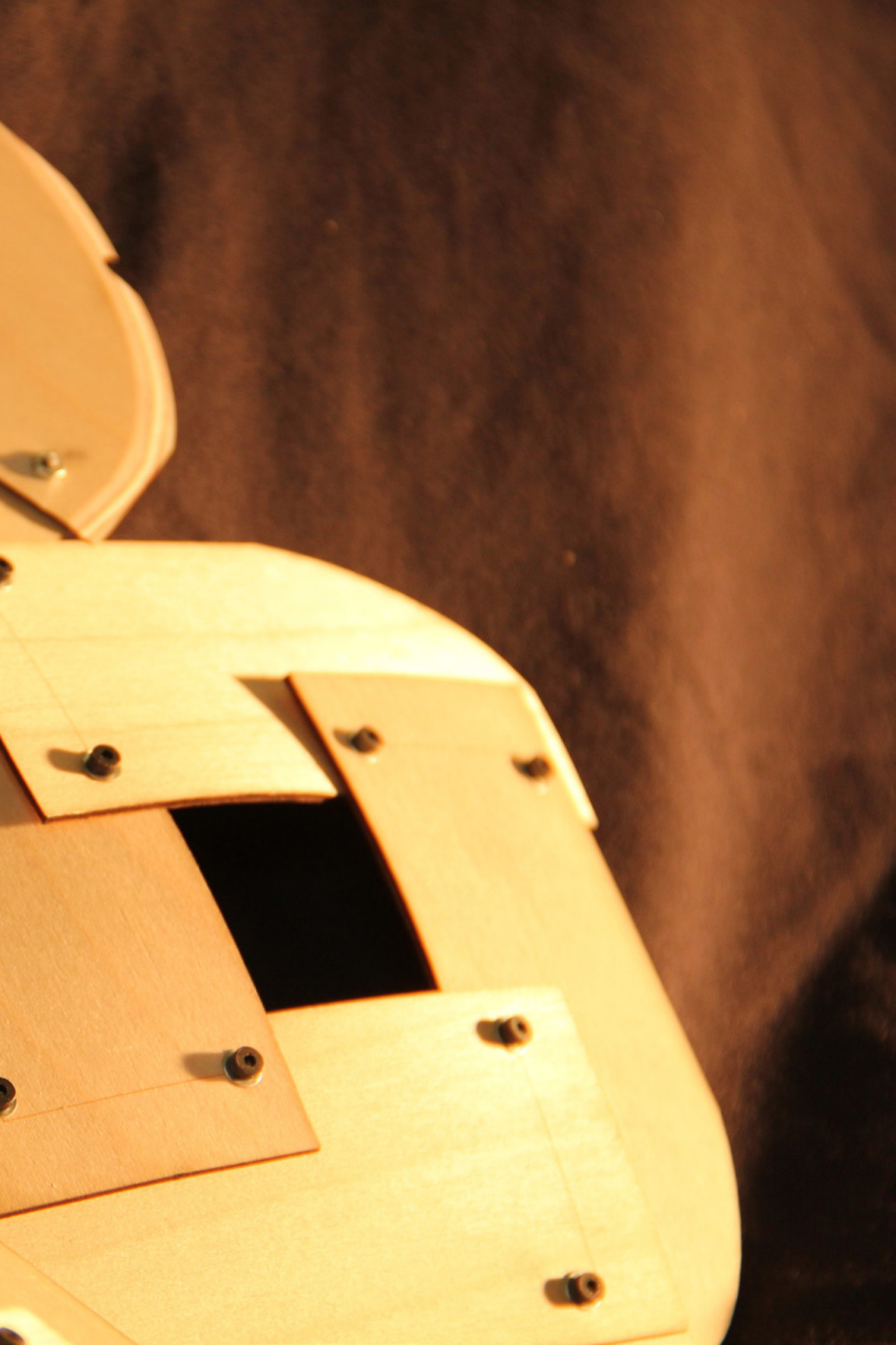


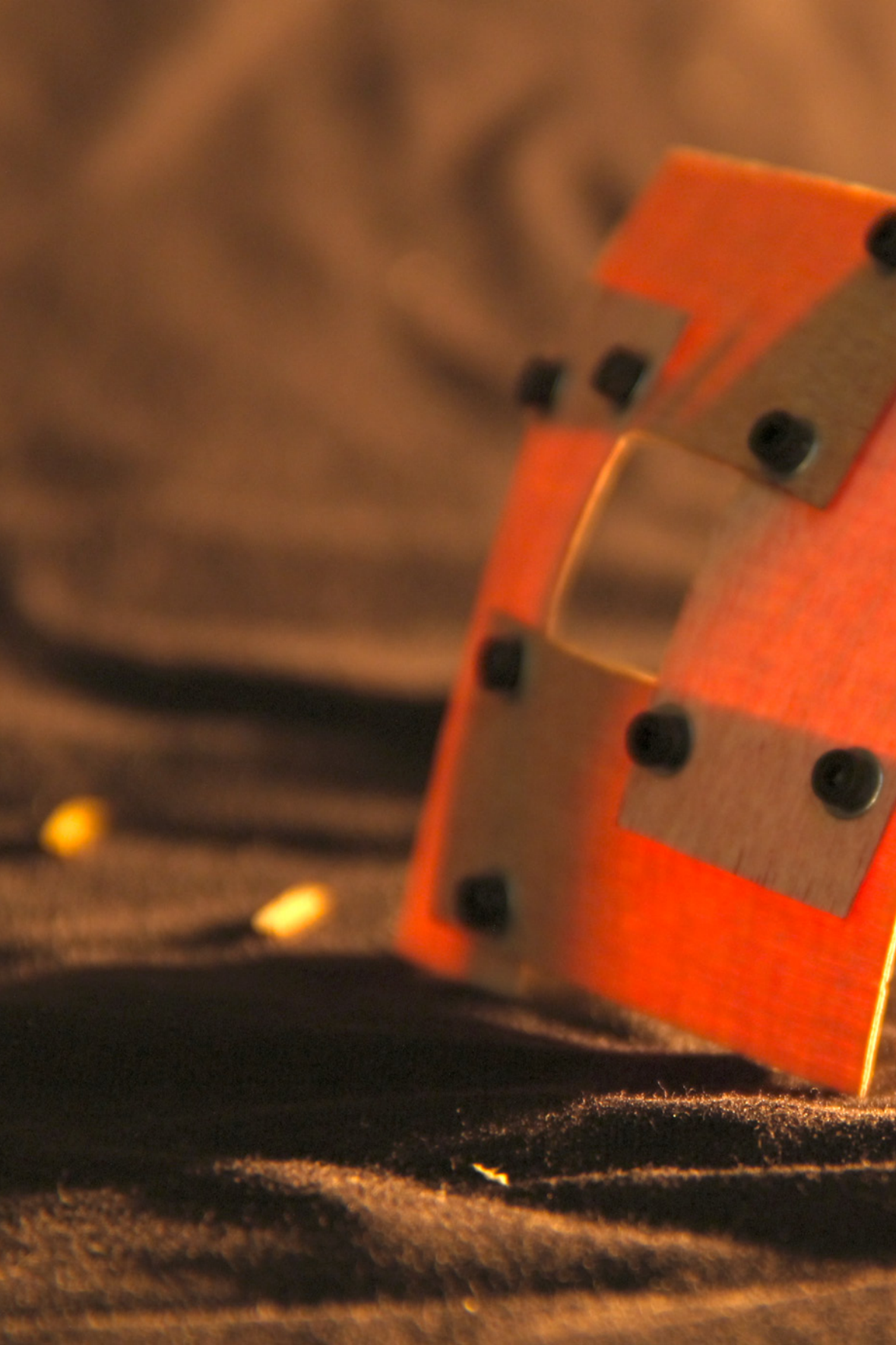



A
B

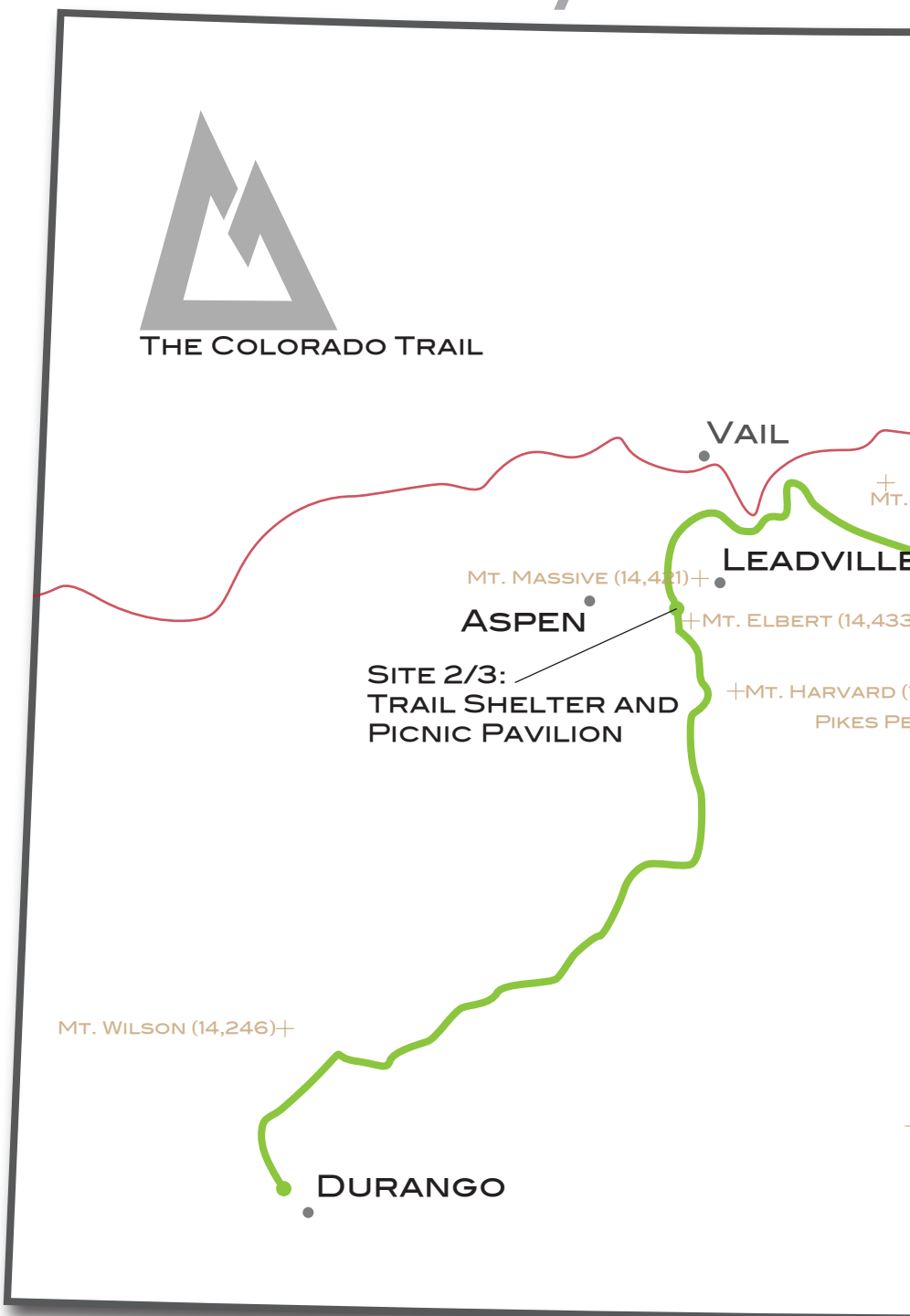


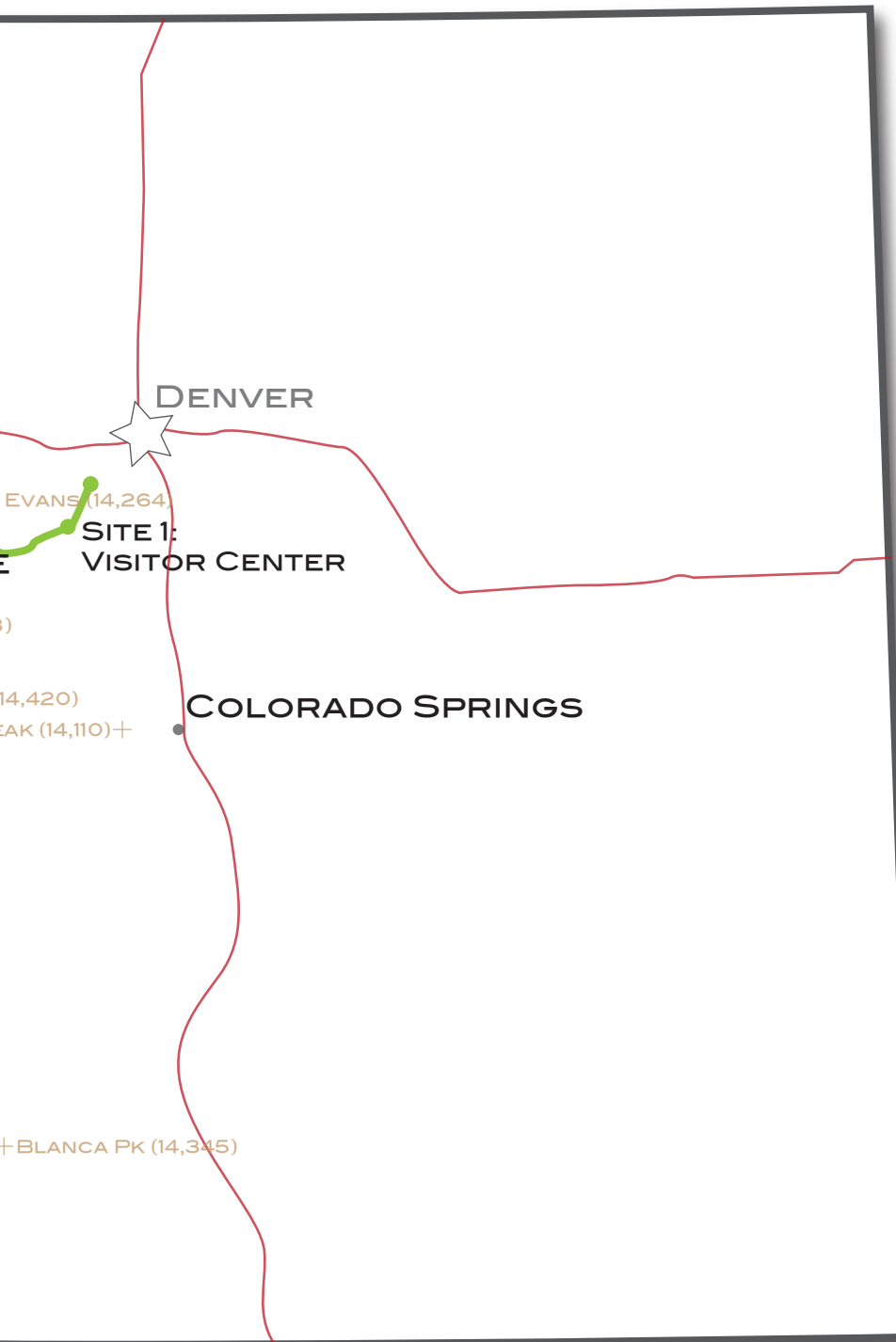






Site Analysis




Denver
Evans (14,264)
Site 1:
Visitor Center
Colorado Springs
14,420)
eak (14,110)+
+Blanca Pk (14,345)

WIND ROSE PLOT
Station #94018 - BOULDER, CO

COMPANY NAME
USDA-ARS

Modeler
Sara West

Date
9 /4/2002

Display
Wind Speed

UNIT
m/s

Avg. Wind Speed
4.02 m/s (8.99 mph)

Calm Winds
4.59%

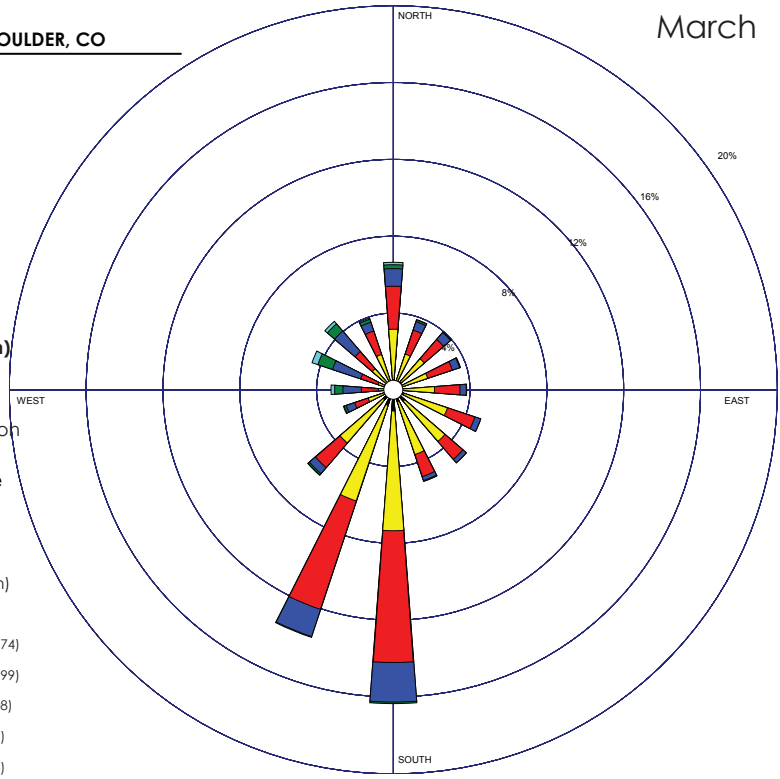
Orientation Direction
(Blowing From)

Plot Year-Date-Time
1961
Jun. 1 - Jun. 30
Midnight - 11PM

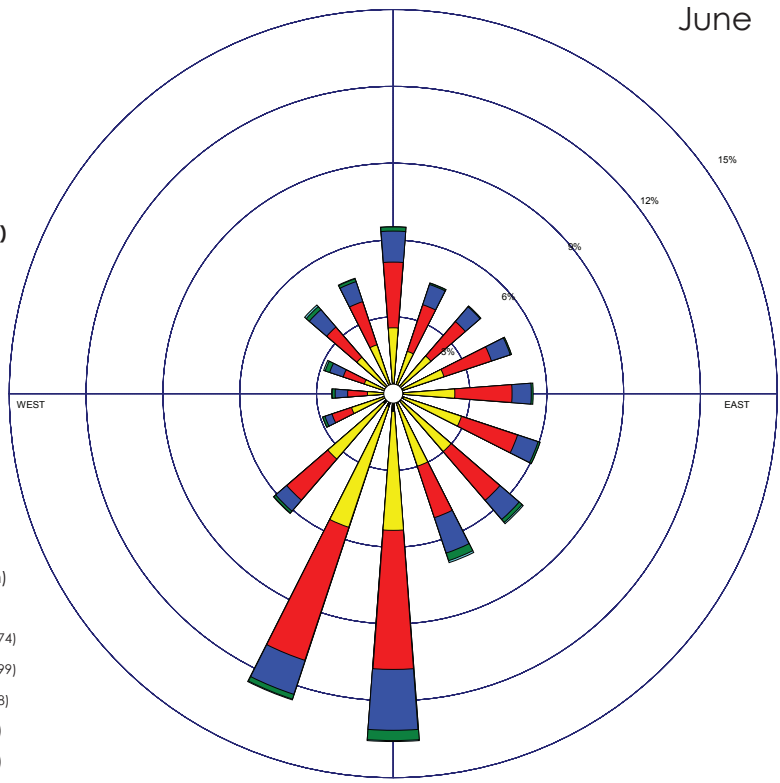
Wind Speed m/s (mph)

- >11.06 (>24.74)
- 8.49-11.06 (18.99-24.74)
- 5.40-8.49 (12.08-18.99)
- 3.34-5.40 (7.47-12.08)
- 1.80-3.34 (4.03-7.47)
- 0.51-1.80 (1.14-4.03)

March



June



Date
9 /4/2002

Display
Wind Speed

UNIT
m/s

Avg. Wind Speed
4.02 m/s (8.99 mph)

Calm Winds
4.59%

Plot Year-Date-Time
1961
Jun. 1 - Jun. 30
Midnight - 11PM

Wind Speed m/s (mph)

- >11.06 (>24.74)
- 8.49-11.06 (18.99-24.74)
- 5.40-8.49 (12.08-18.99)
- 3.34-5.40 (7.47-12.08)
- 1.80-3.34 (4.03-7.47)
- 0.51-1.80 (1.14-4.03)

September

Date
9 /4/2002

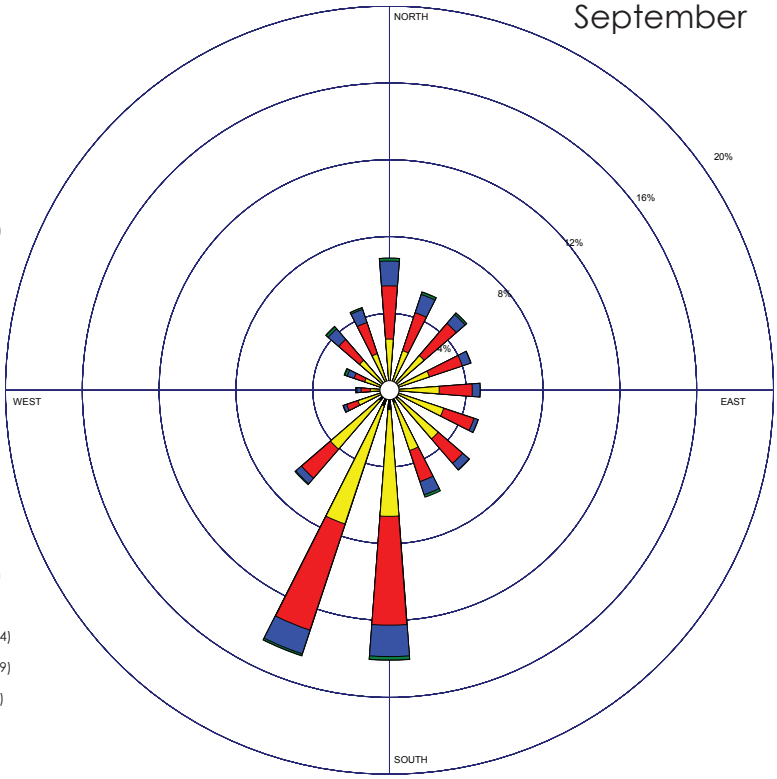
Display
Wind Speed

UNIT
m/s

Avg. Wind Speed
3.67 m/s (8.21 mph)

Calm Winds
6.16%

Plot Year-Date-Time
1961
Sep. 1 - Sep. 31
Midnight - 11PM



Wind Speed m/s (mph)

- >11.06 (>24.74)
- 8.49-11.06 (18.99-24.74)
- 5.40-8.49 (12.08-18.99)
- 3.34-5.40 (7.47-12.08)
- 1.80-3.34 (4.03-7.47)
- 0.51-1.80 (1.14-4.03)

December

Date
9 /4/2004

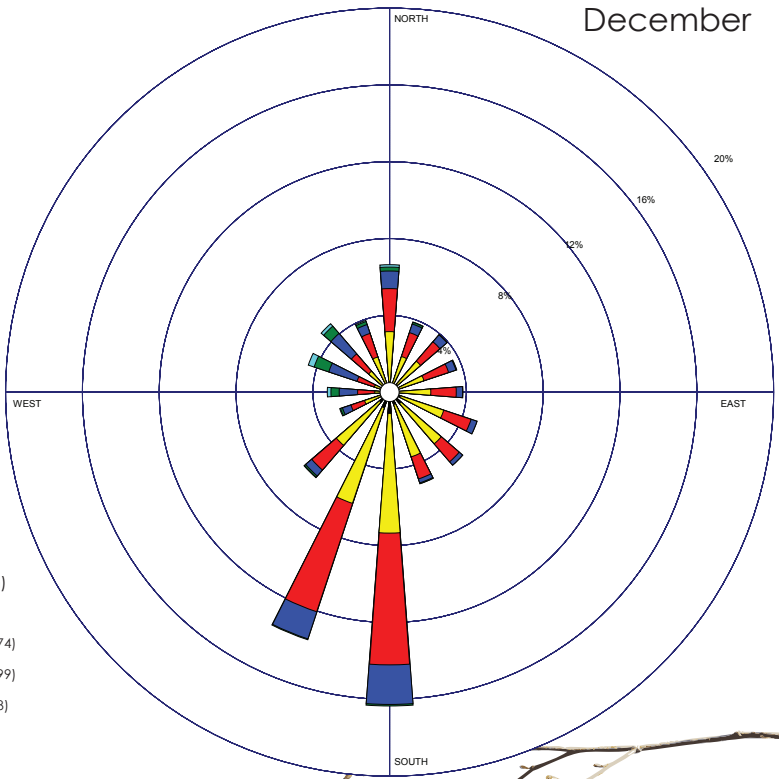
Display
Wind Speed

UNIT
m/s

Avg. Wind Speed
3.9 m/s (8.72 mph)

Calm Winds
8.34%

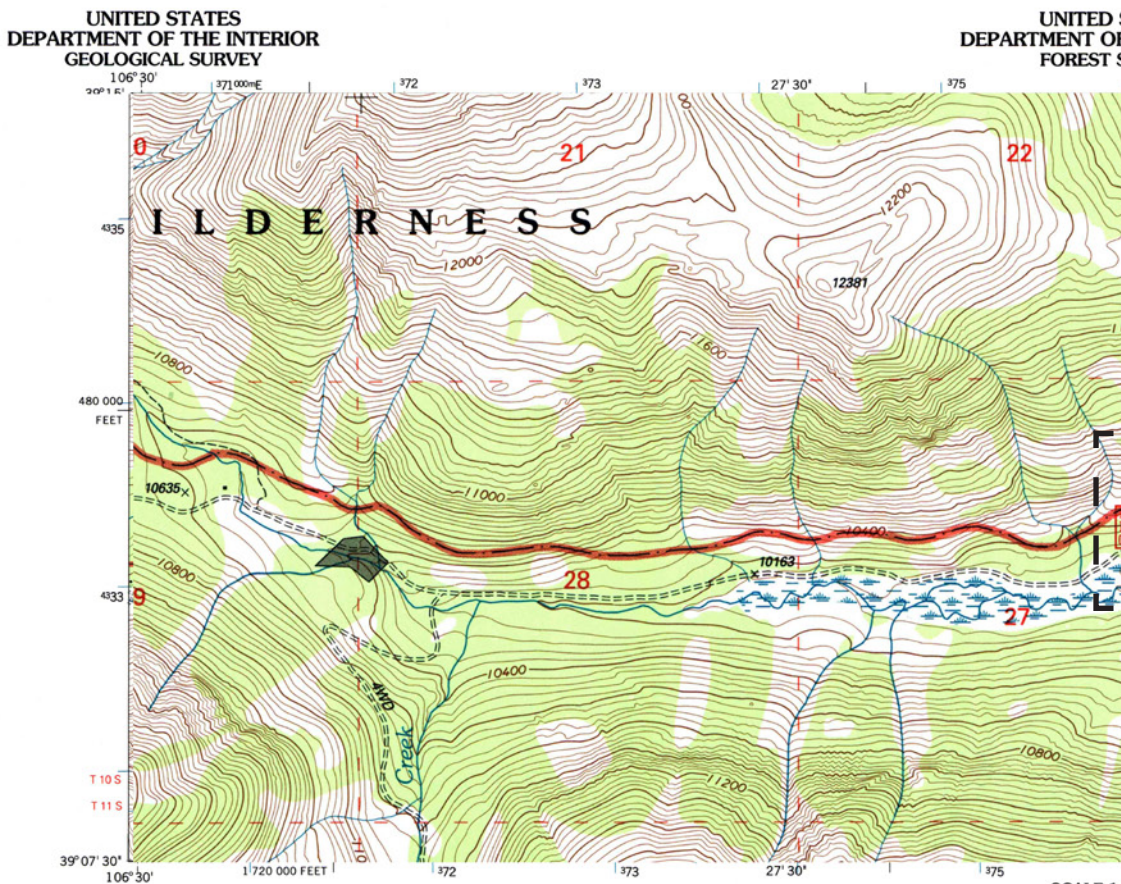
Plot Year-Date-Time
1961
Dec. 1 - Dec. 31
Midnight - 11PM



Wind Speed m/s (mph)

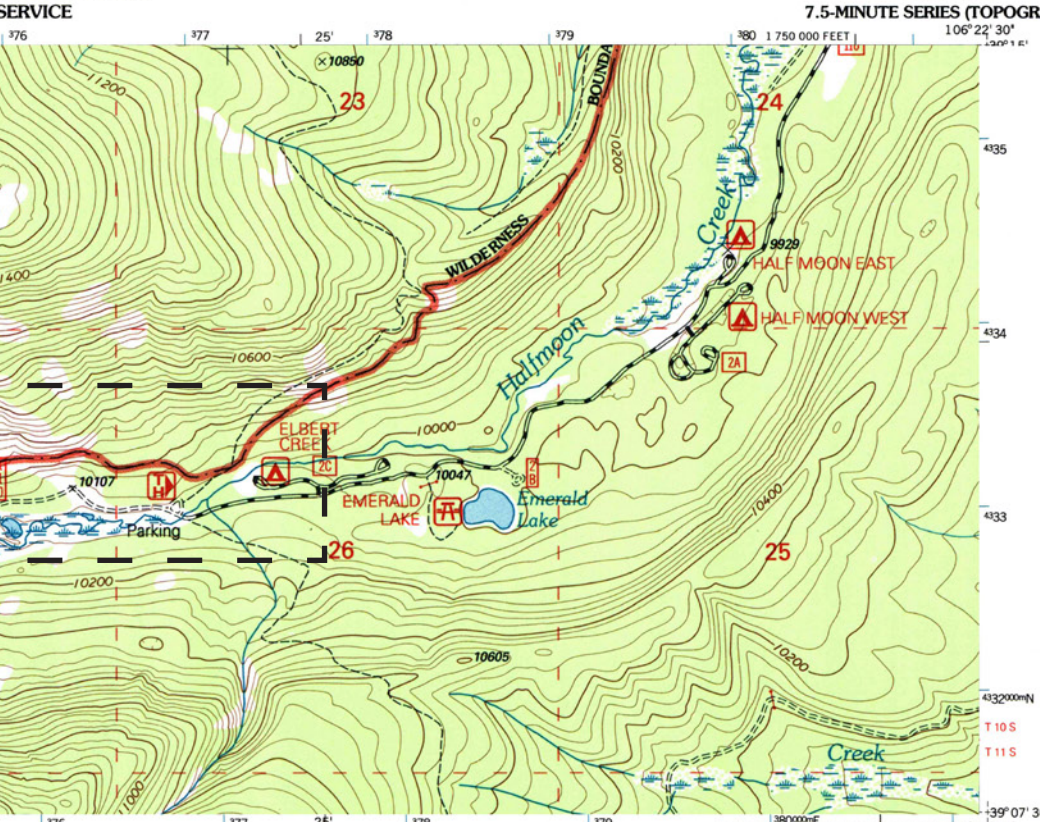
- >11.06 (>24.74)
- 8.49-11.06 (18.99-24.74)
- 5.40-8.49 (12.08-18.99)
- 3.34-5.40 (7.47-12.08)
- 1.80-3.34 (4.03-7.47)
- 0.51-1.80 (1.14-4.03)

Site 2:
Sleep Shelter



STATES
F AGRICULTURE
SERVICE

MOUNT MASSIVE QUADRANGLE
COLORADO
7.5-MINUTE SERIES (TOPOGRAPHIC)



INTERIOR-GEOLOGICAL SURVEY, RESTON VIRGINIA-1998

:24 000

5000 6000 7000 8000 9000 10 000
1000 2000

RVAL 40 FEET
RTICAL DATUM OF 1929
ERS MULTIPLY BY 0.3048

AL MAP ACCURACY STANDARDS
O. BOX 25286, DENVER, COLORADO 80225
AND SYMBOLS IS AVAILABLE ON REQUEST

COLORADO
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Nast
2 Homestake Reservoir
3 Leadville North
4 Mount Champion
5 Leadville South
6 Independence Pass
7 Mount Elbert
8 Granite

ADJOINING 7.5' QUADRANGLES

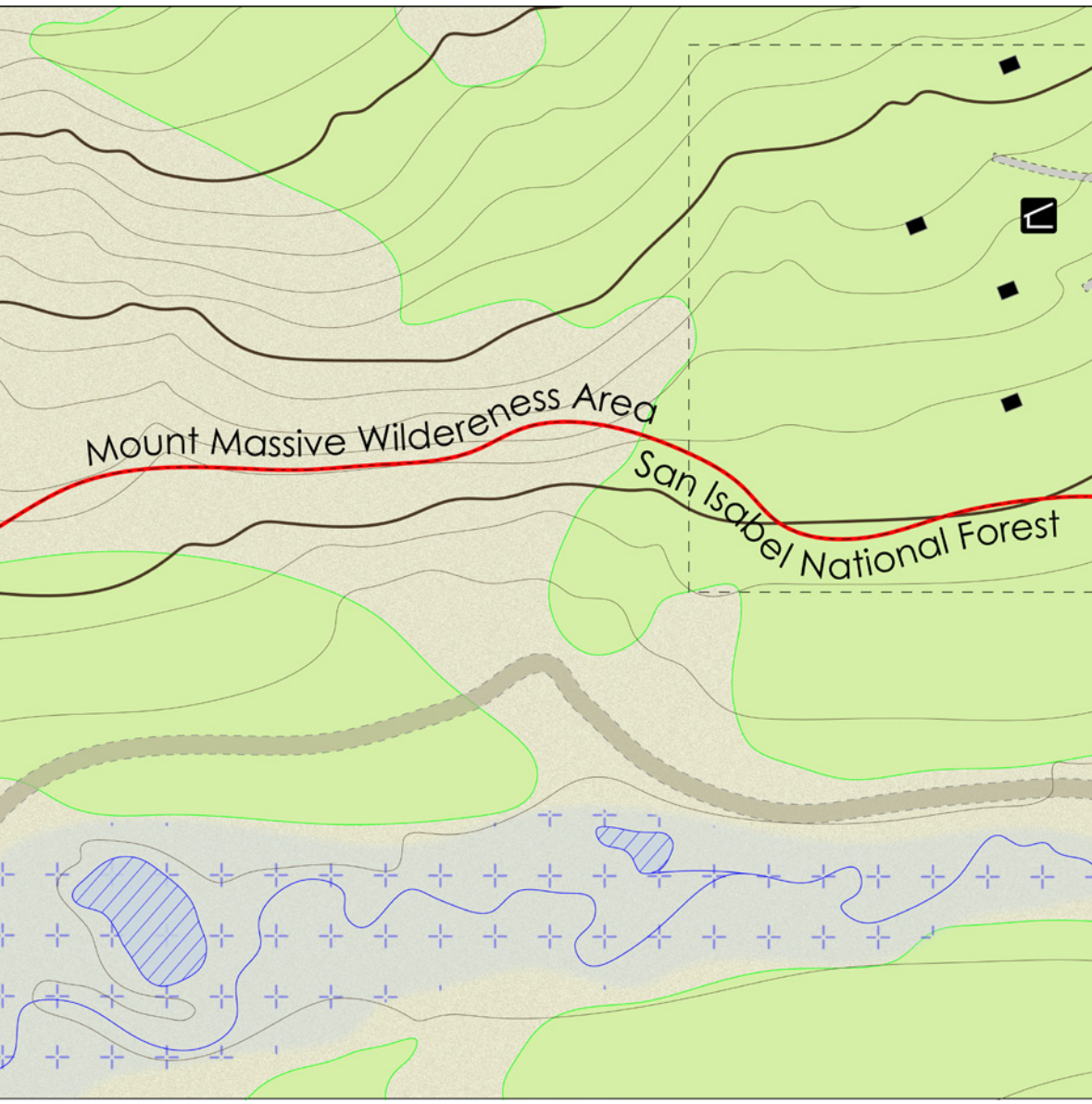
HIGHWAYS AND ROADS

Interstate 5
U. S. 285
State 79
County 9
National Forest, suitable for passenger cars 105 61
National Forest, suitable for high clearance vehicles 115
National Forest Trail 384

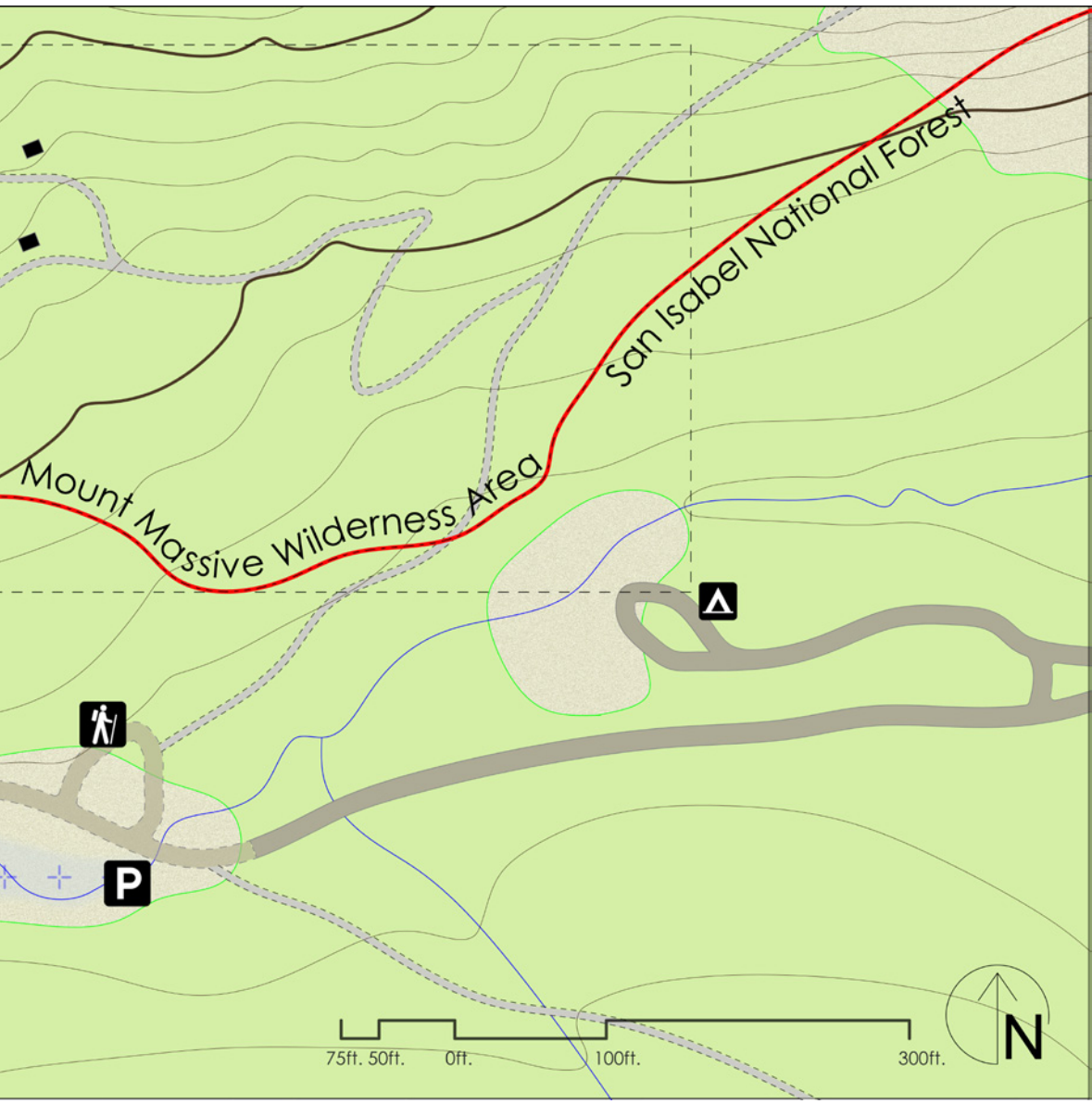
Primary highway .....
Secondary highway.....
Light-duty road
Composition: Unspecified...
Paved.....
Gravel .....
Dirt .....
Unimproved; 4 wheel drive 4WD
Trail .....
Gate; Barrier.....

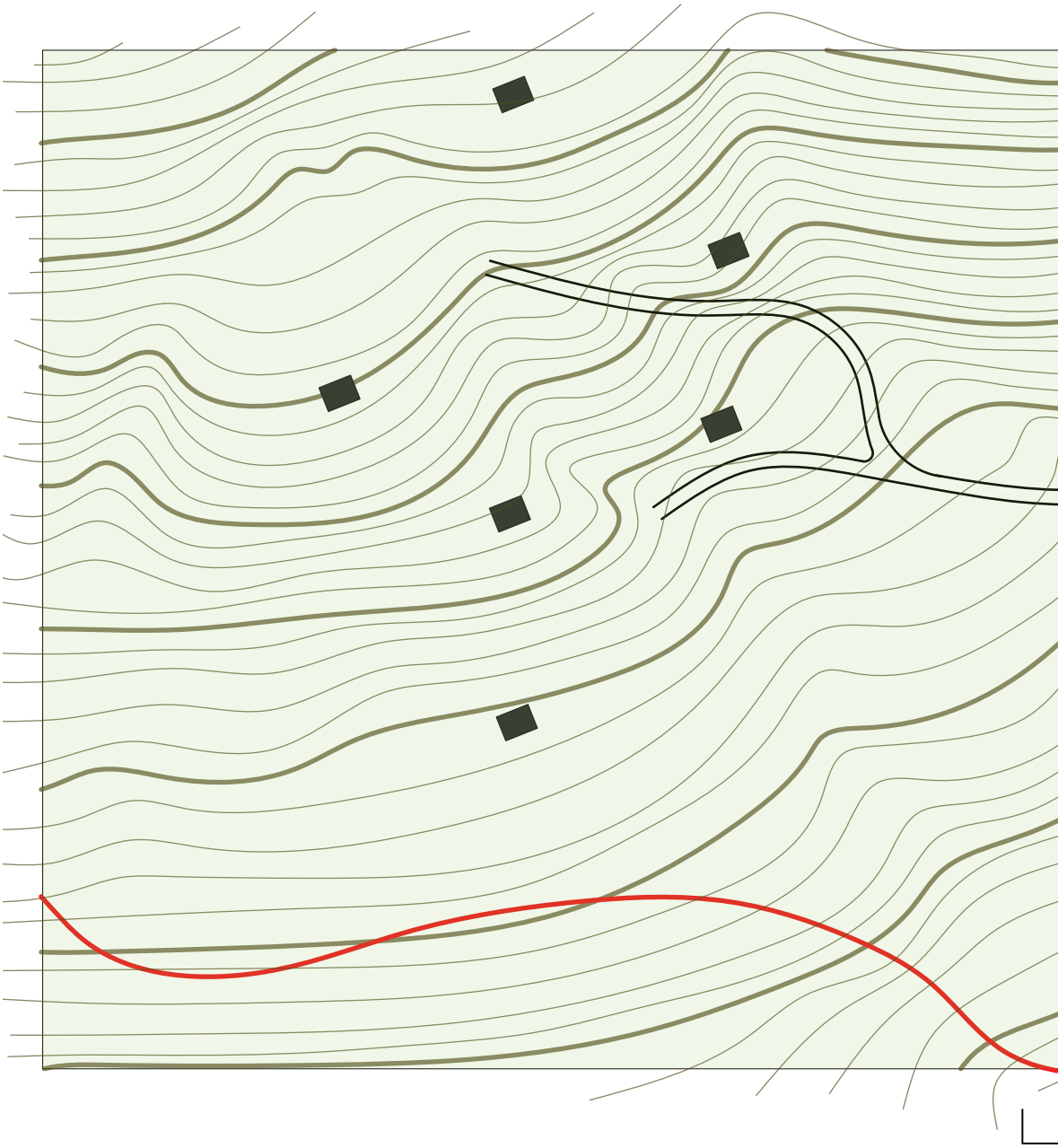
MOUNT MASSIVE, CO
1994
NIMA 4762 III NW - SERIES V877

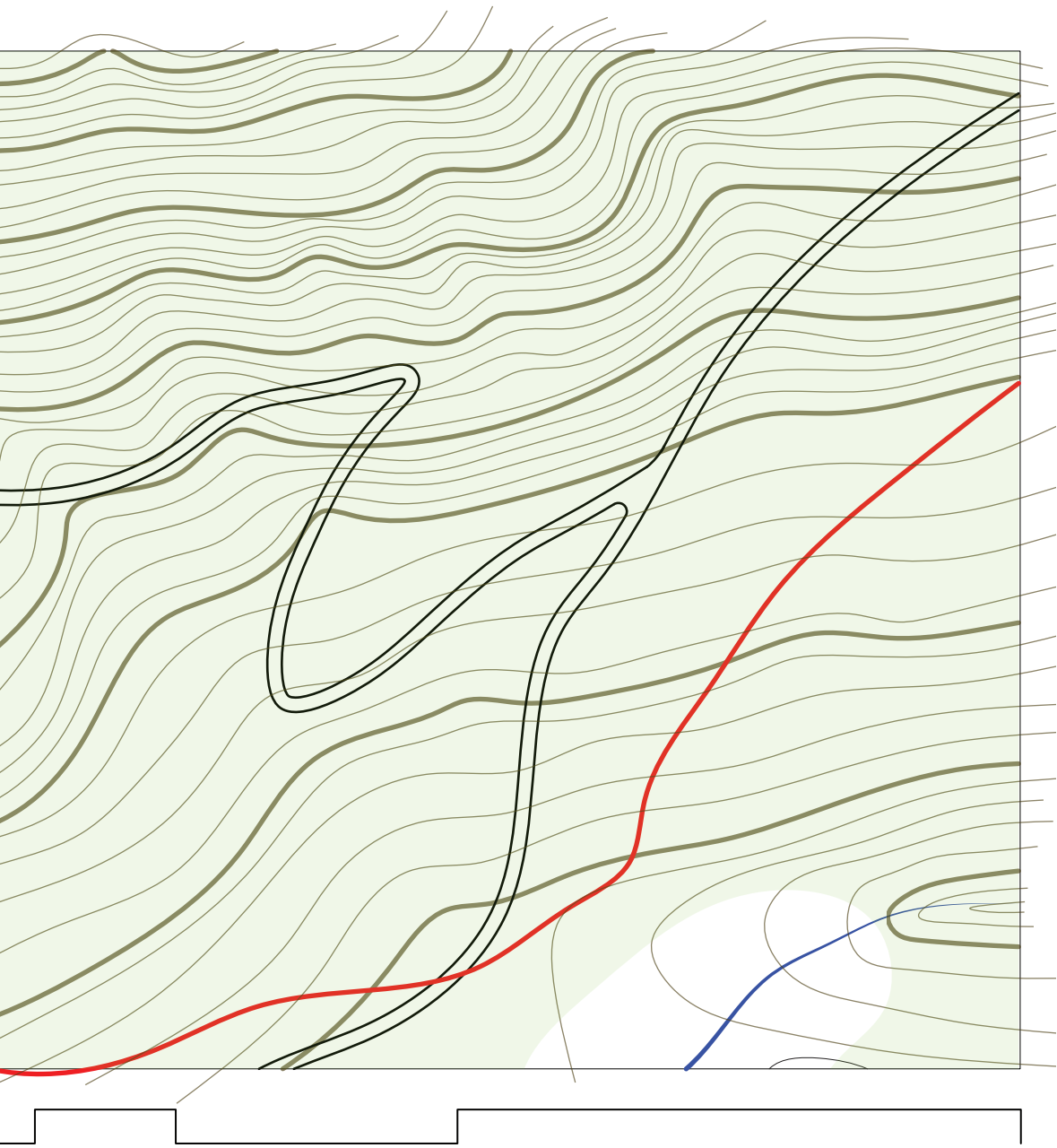
Location:
39° 9’9.63”N 106°25’23.07”W

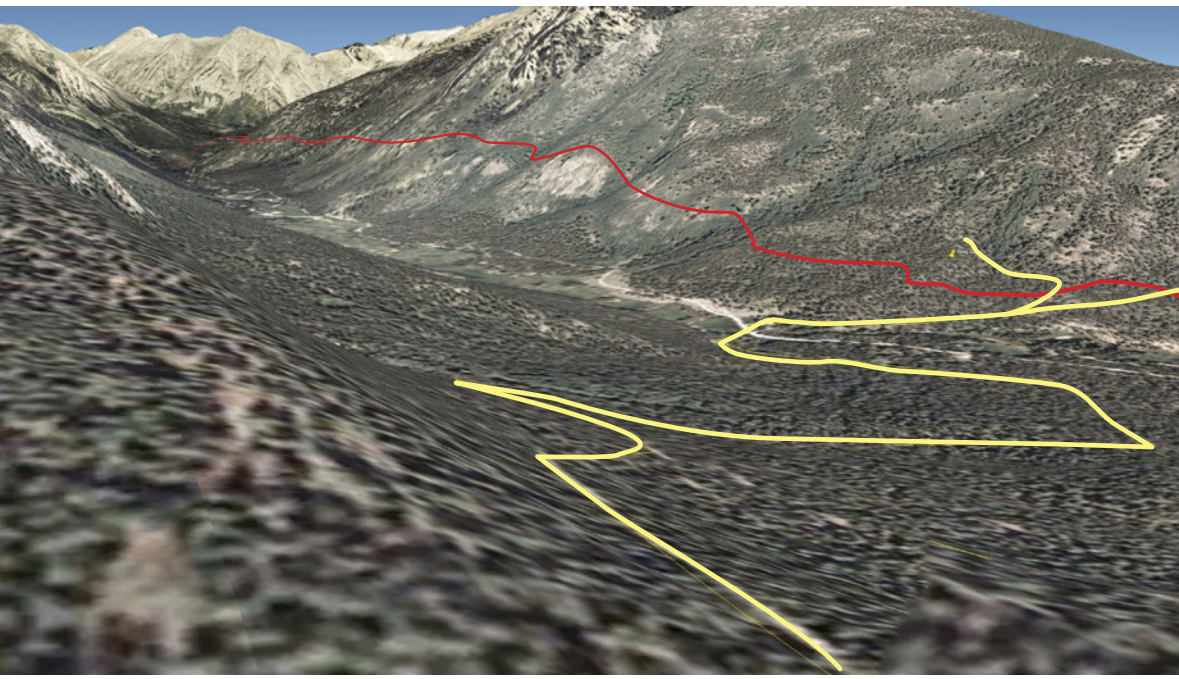


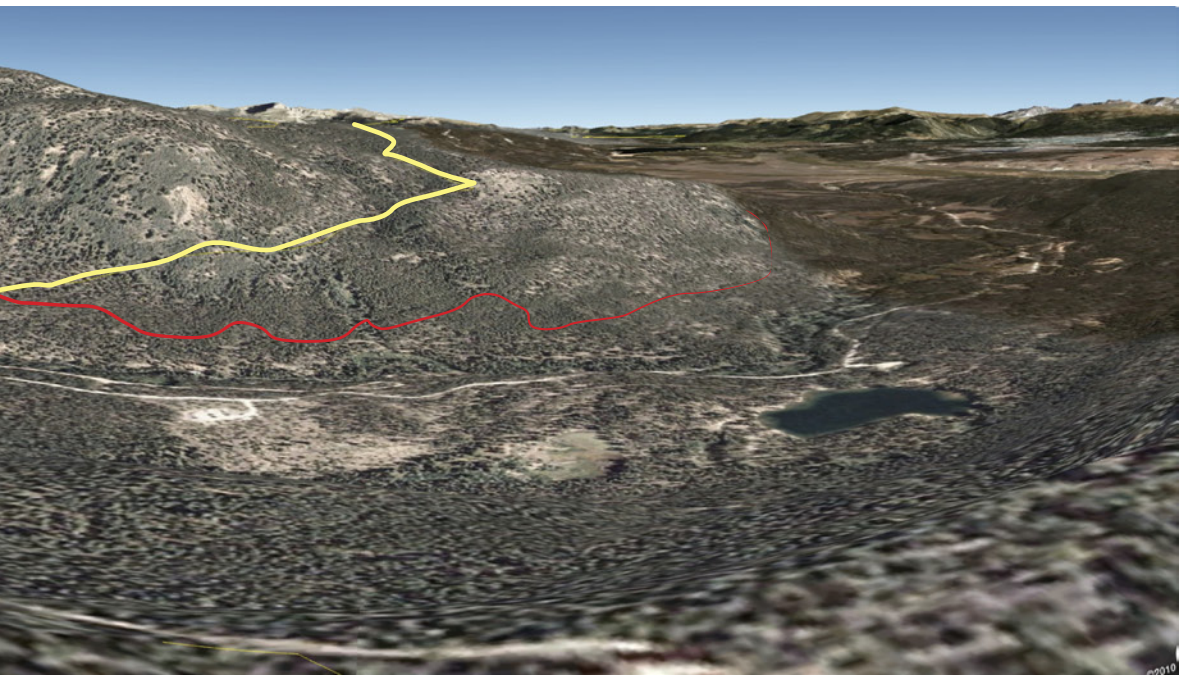
Elevation: 10,139 ft.

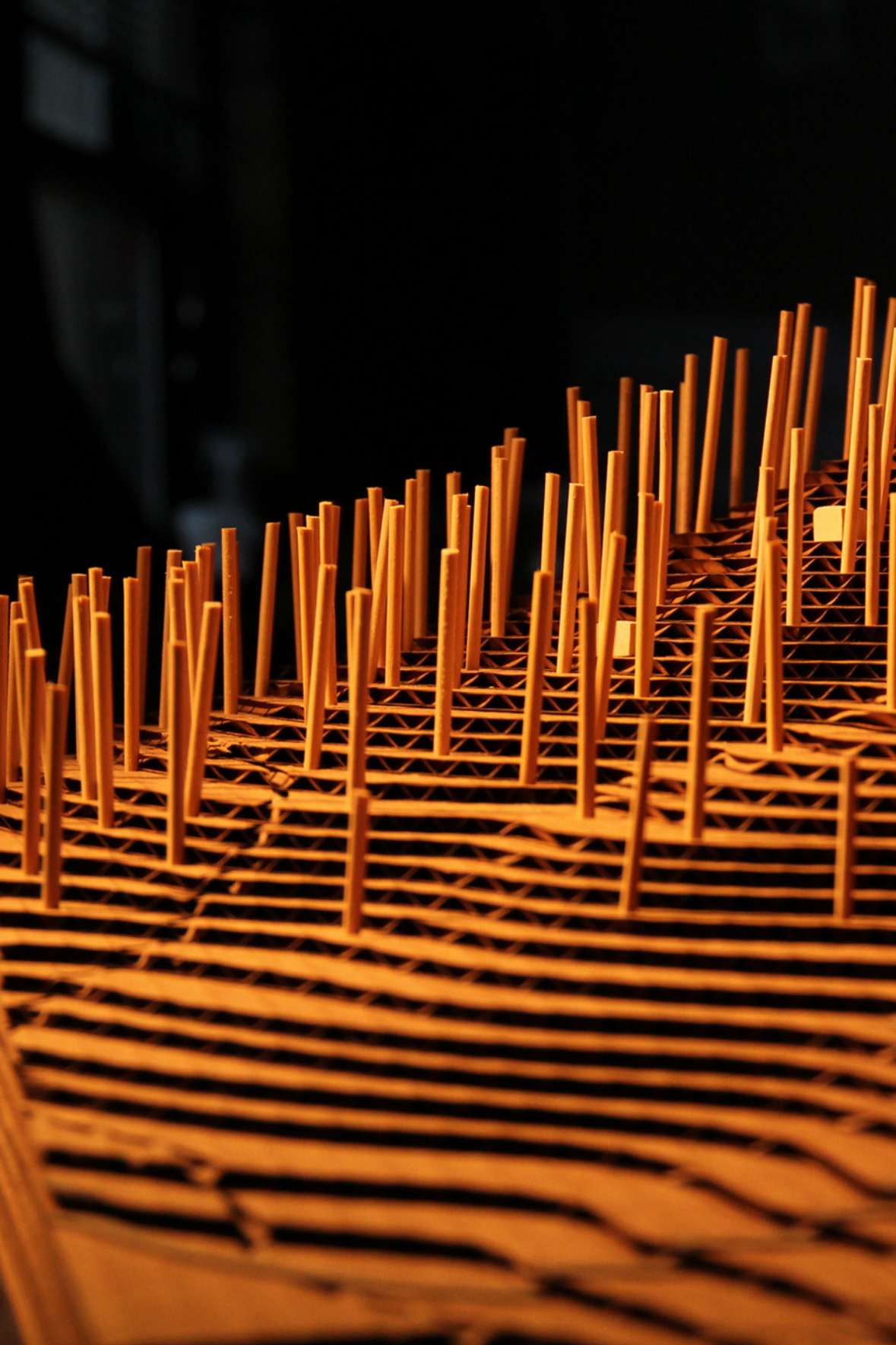


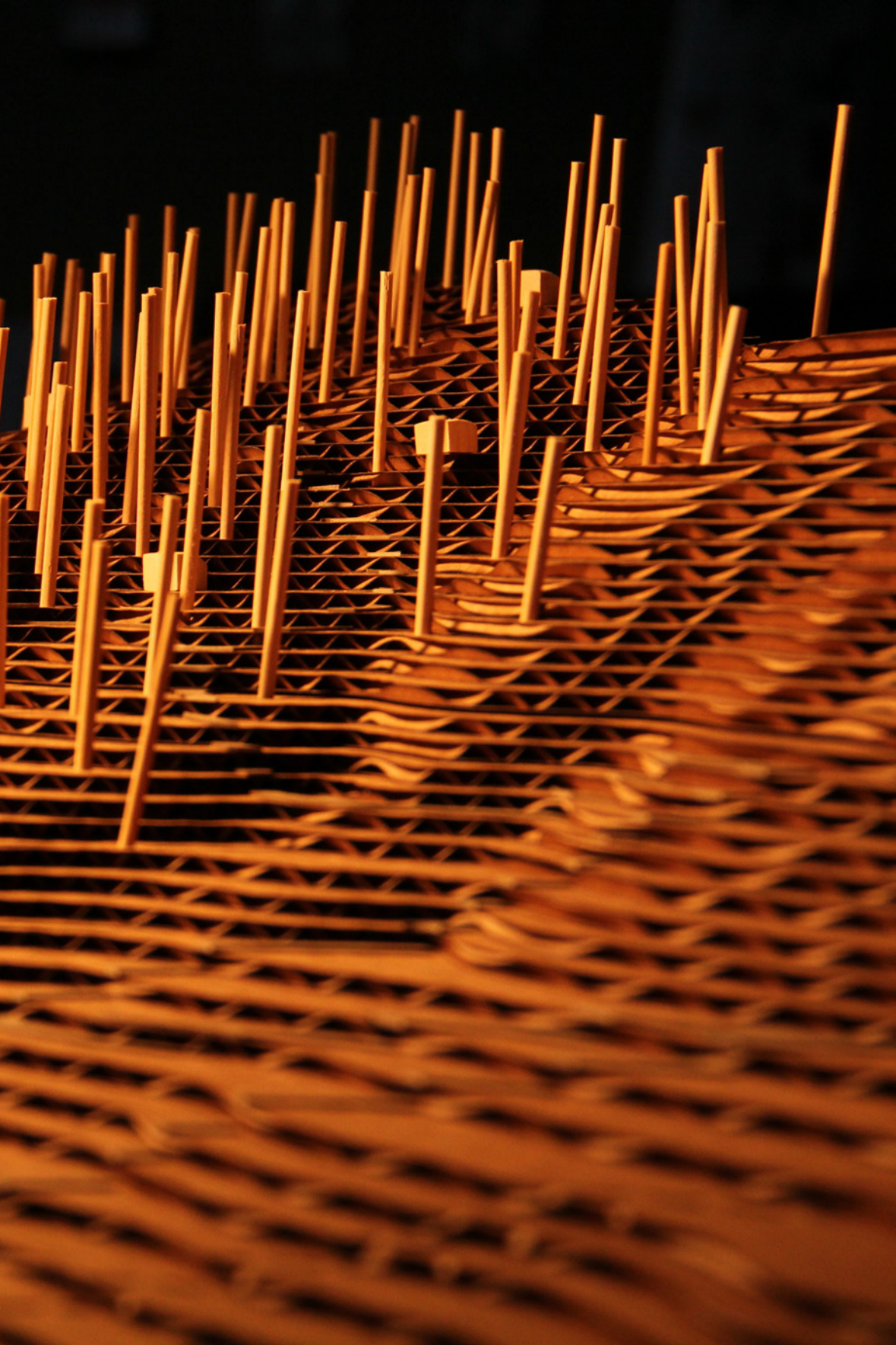


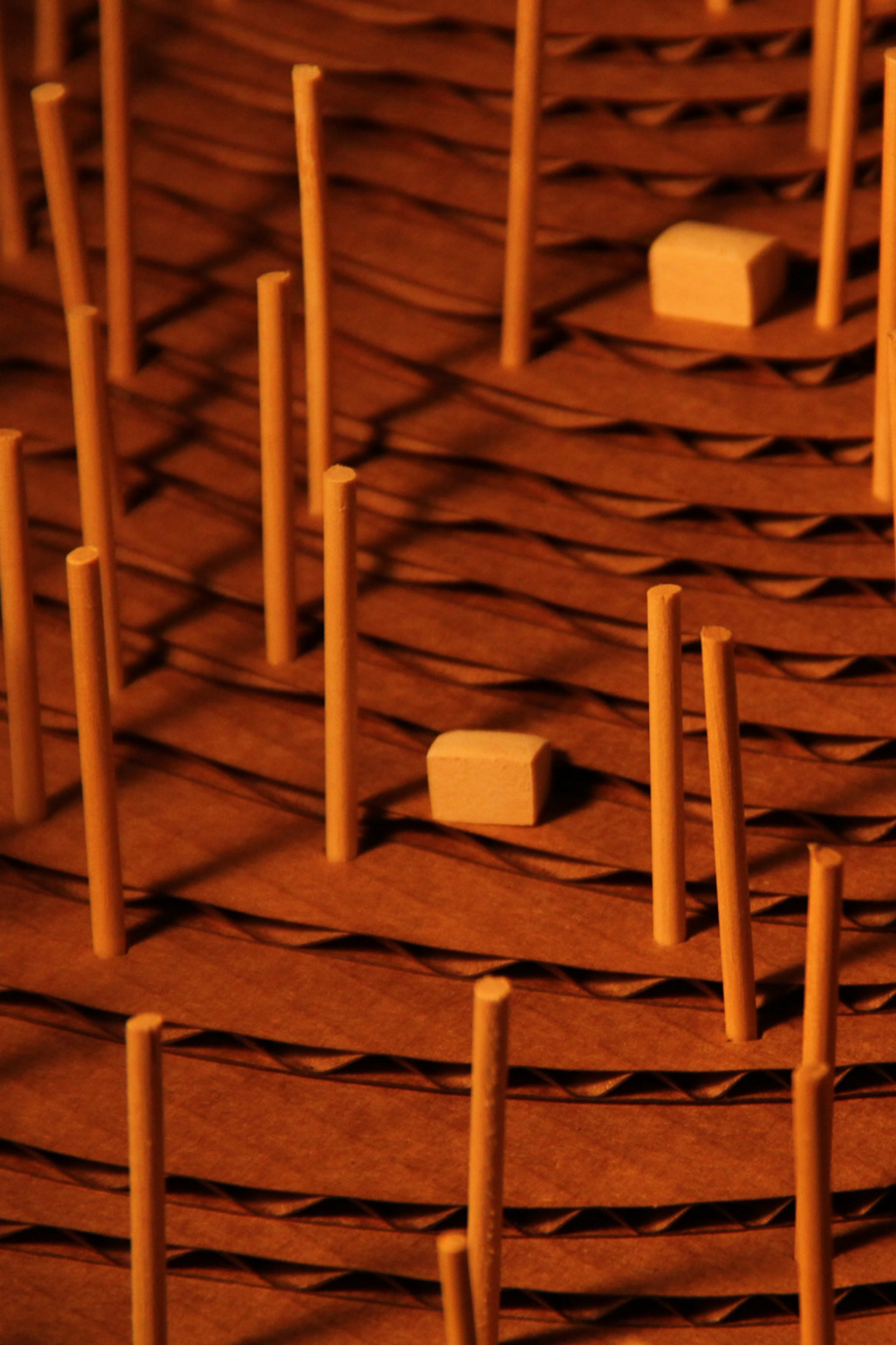


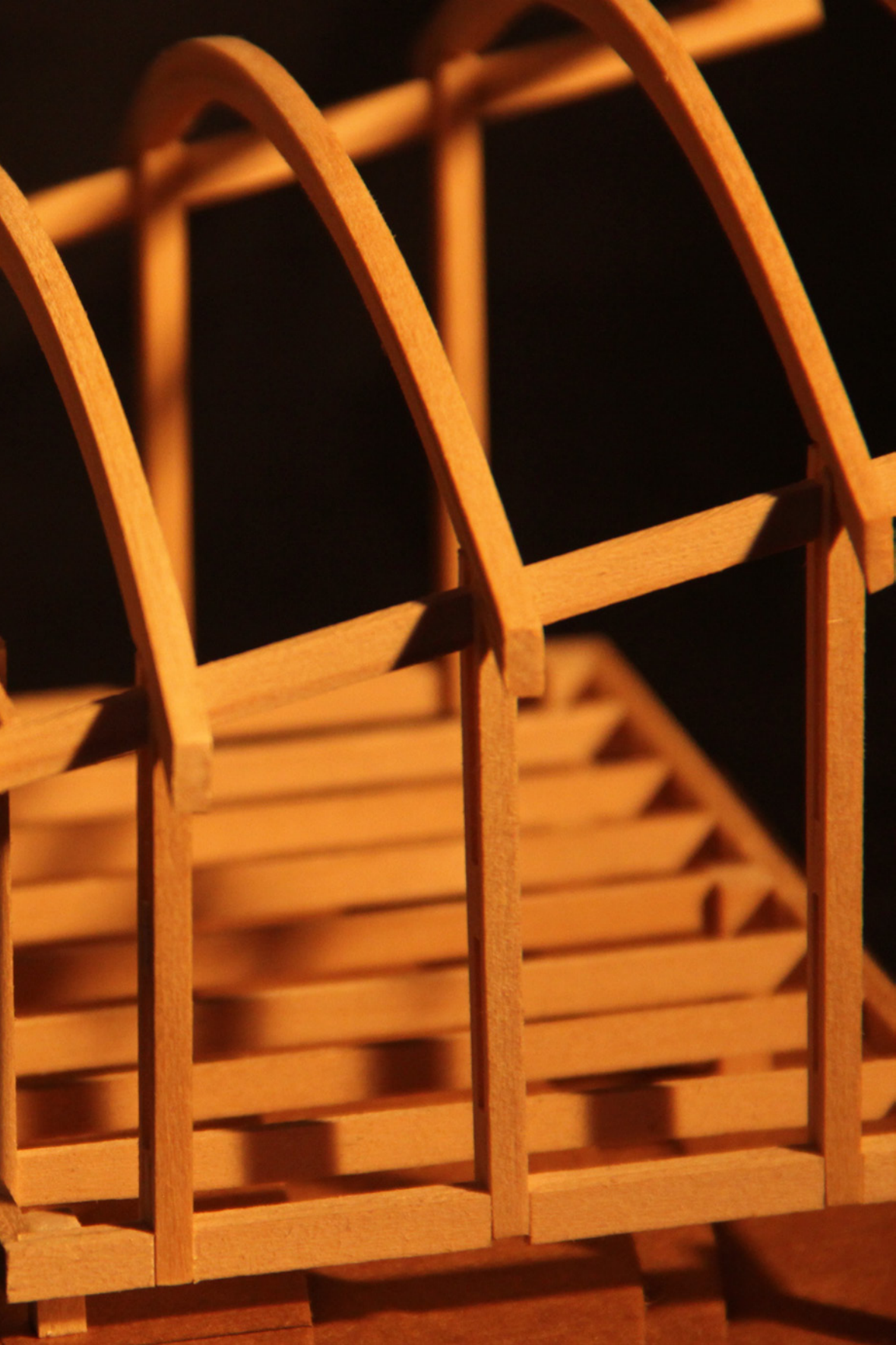




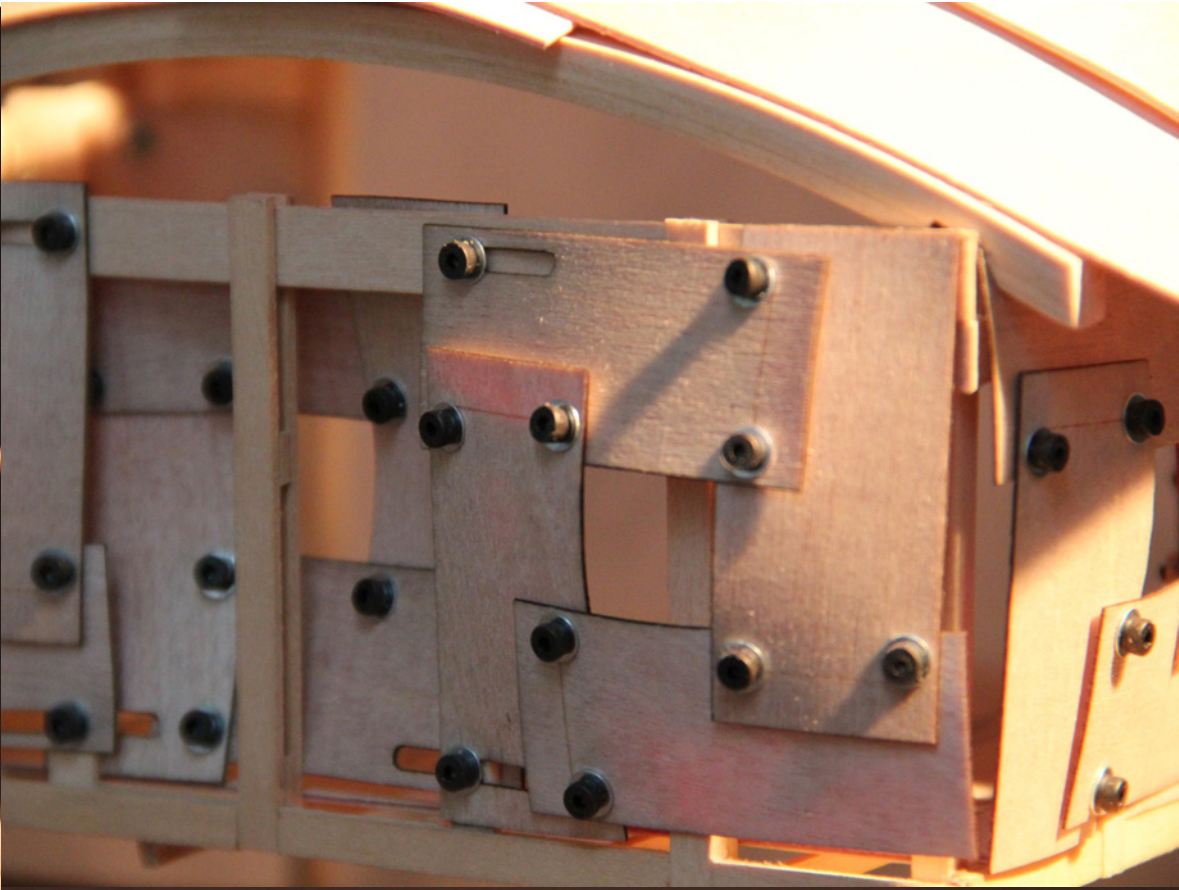


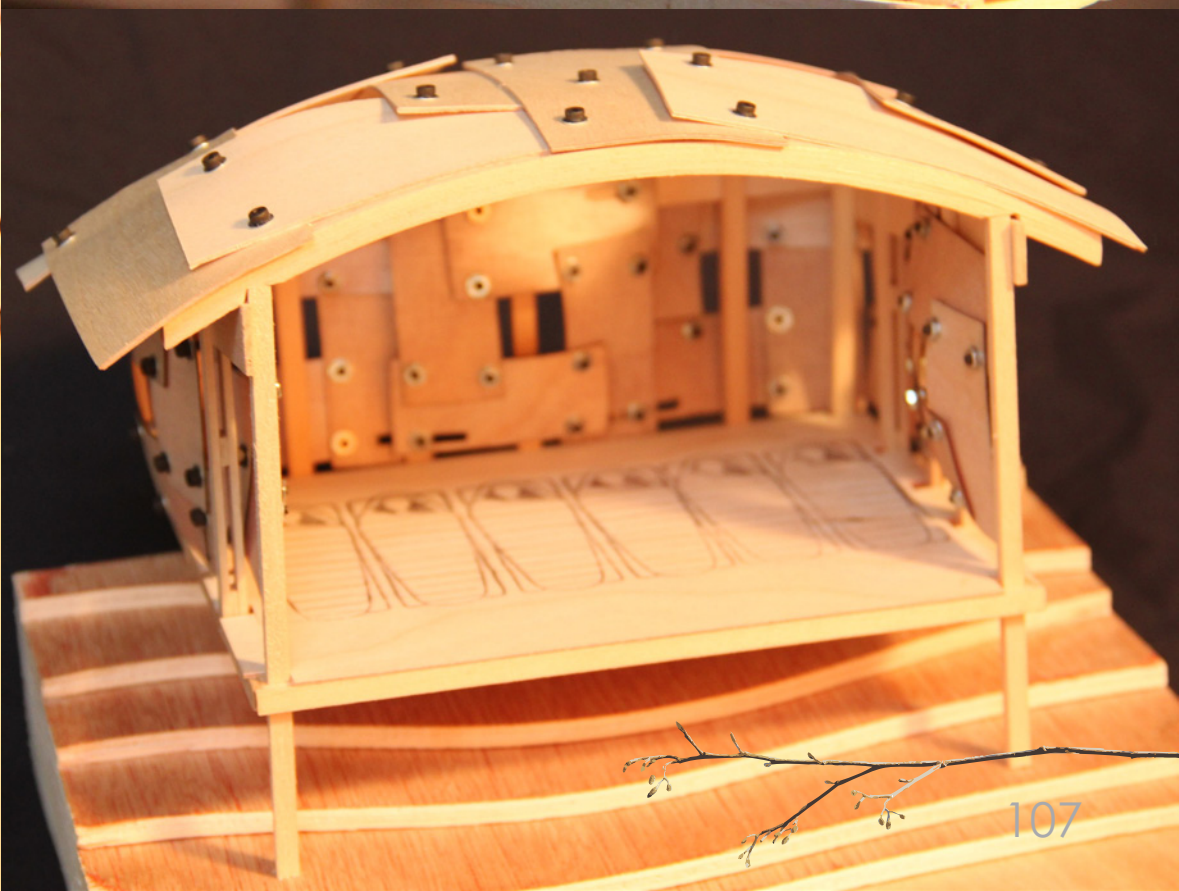




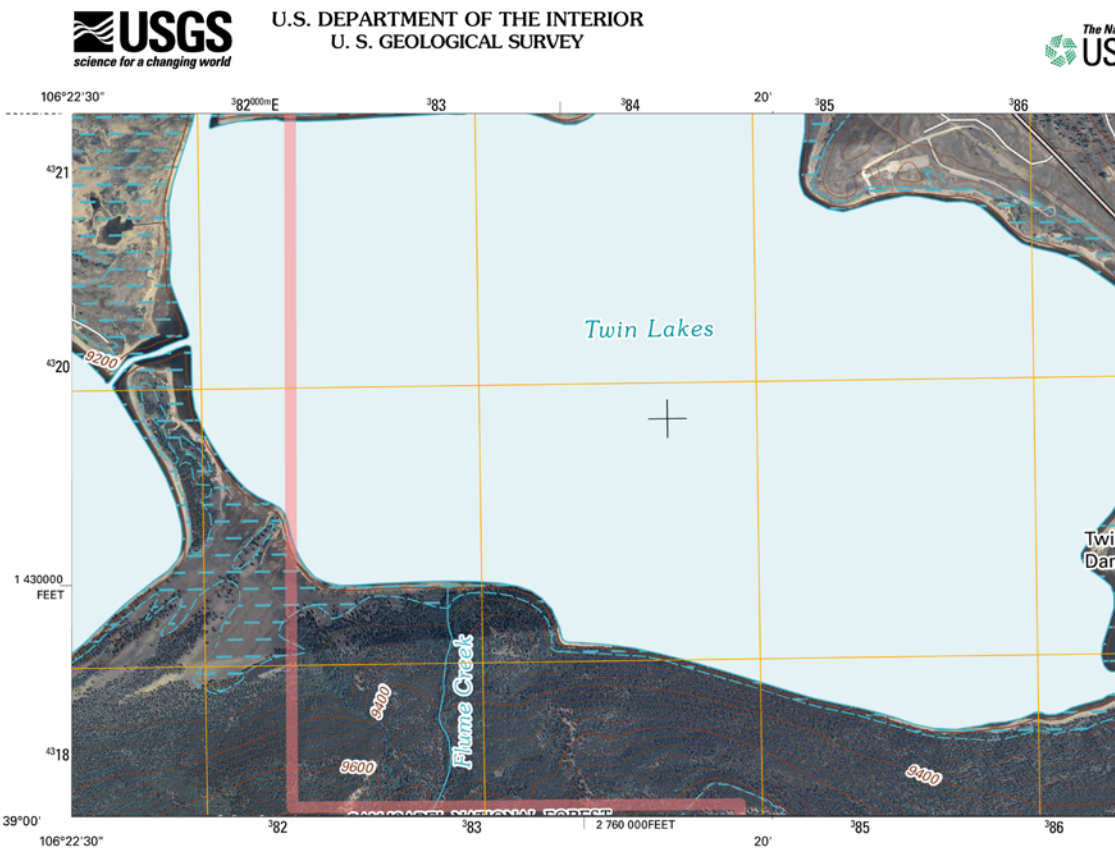


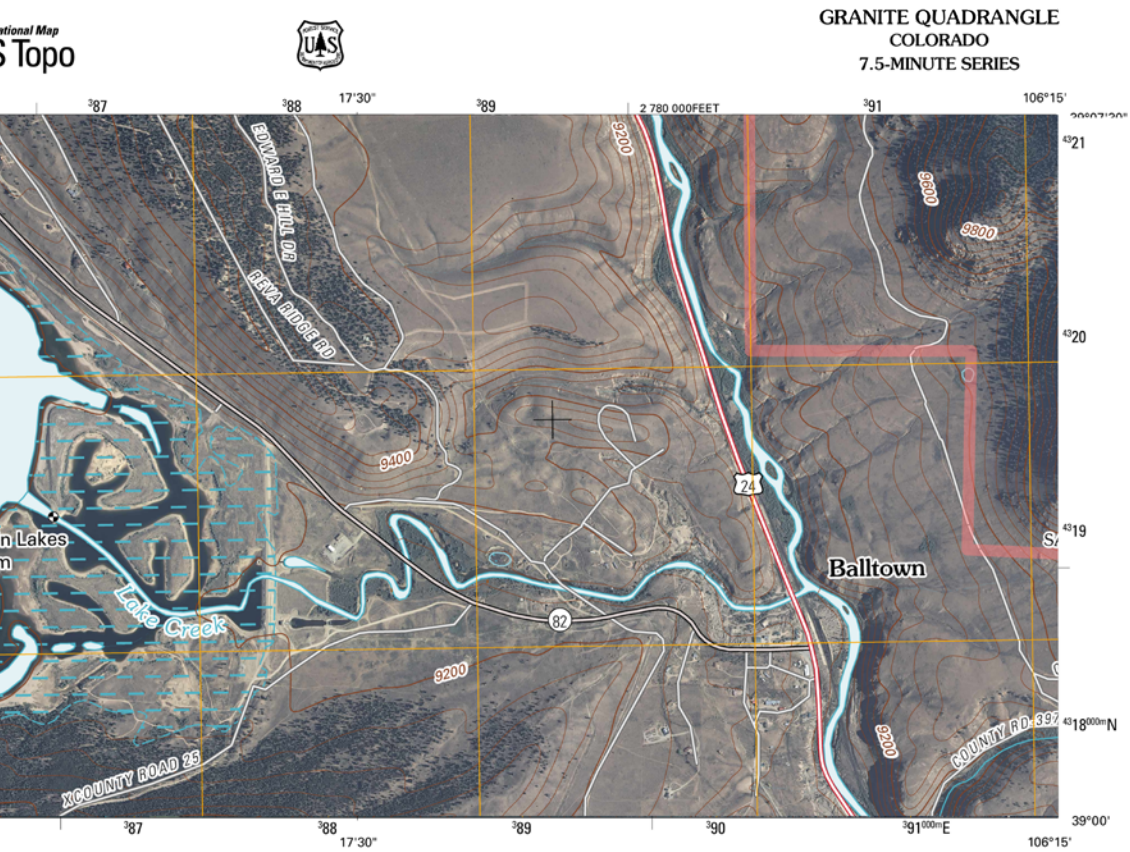

The Colorado Trail Sleep Shelter
0ft.
2ft.
6ft.
12ft.
Scale 1:24





Site 3:
Picnic Shelter





1:24 000

METERS 1 2
ETERS 1000 2000
0 1
MILES
5000 6000 7000 8000 9000 10000
EET

TERVAL 40 FEET
ERTICAL DATUM OF 1988

nform with version 0.5.10 of the
7.5-Minute Quadrangle Maps.
this product is draft version 0.5.13

QUADRANGLE LOCATION

Mount Massive	Leadville South	Mount Sherman
Mount Elbert	Granite	South Peak
Winfield	Mount Harvard	Harvard Lakes

ADJOINING 7.5' QUADRANGLES

ROAD CLASSIFICATION

Interstate Route
US Route
Ramp
State Route
Local Road
4WD

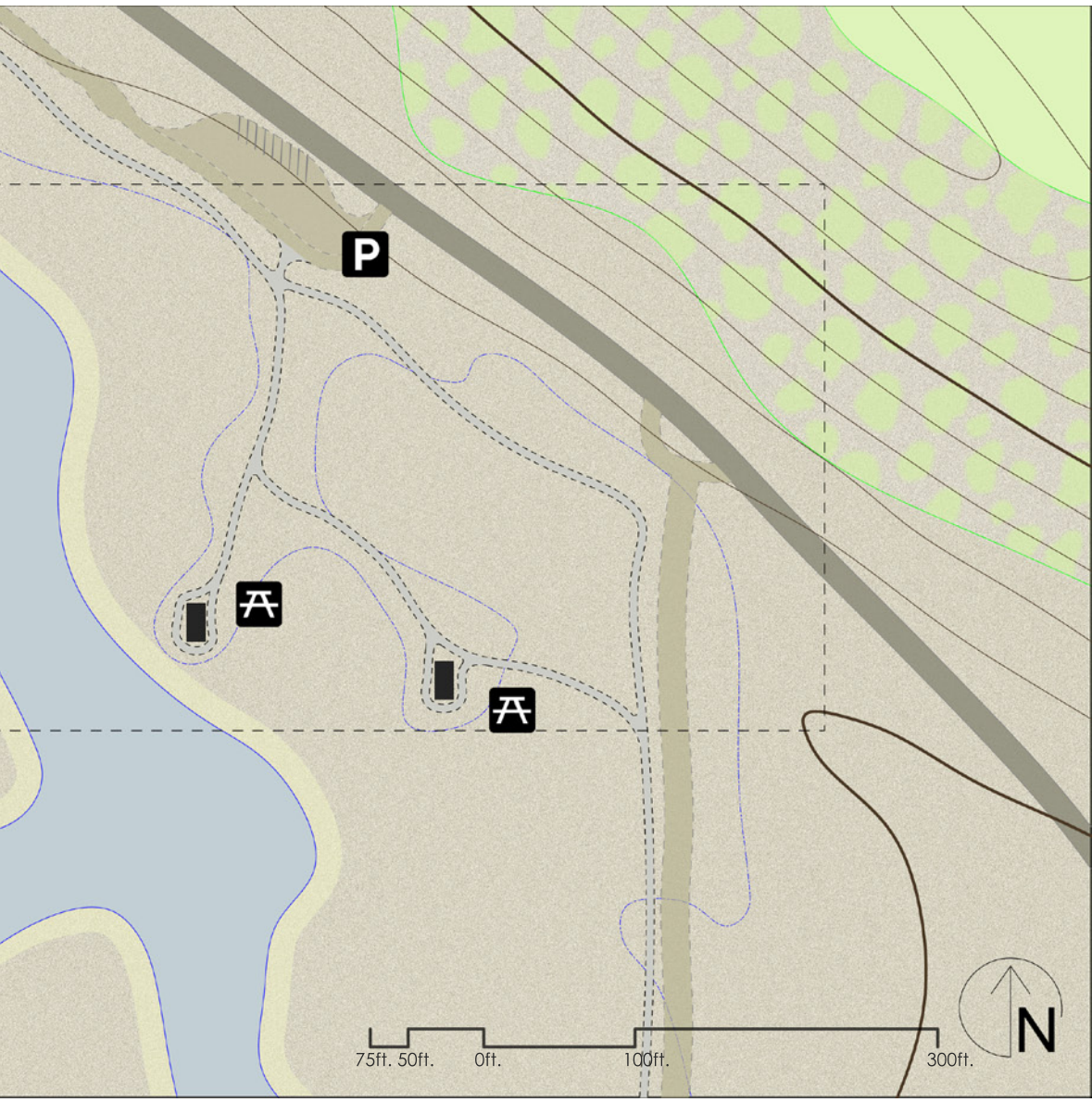
Interstate Route
US Route
State Route
FS Primary Route
FS Passenger Route
FS High Clearance Route

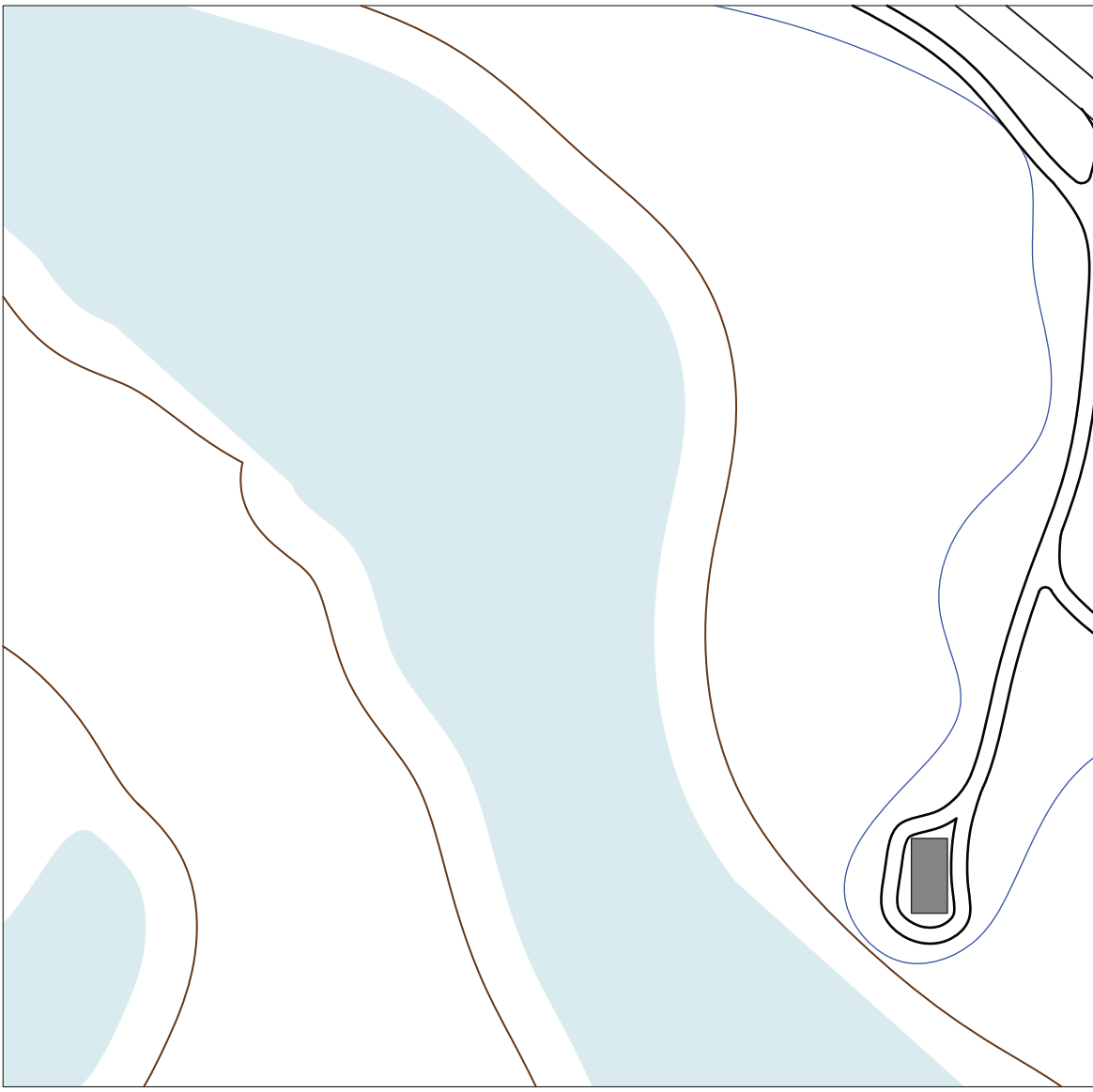
Check with local Forest Service unit
for current travel conditions and restrictions.

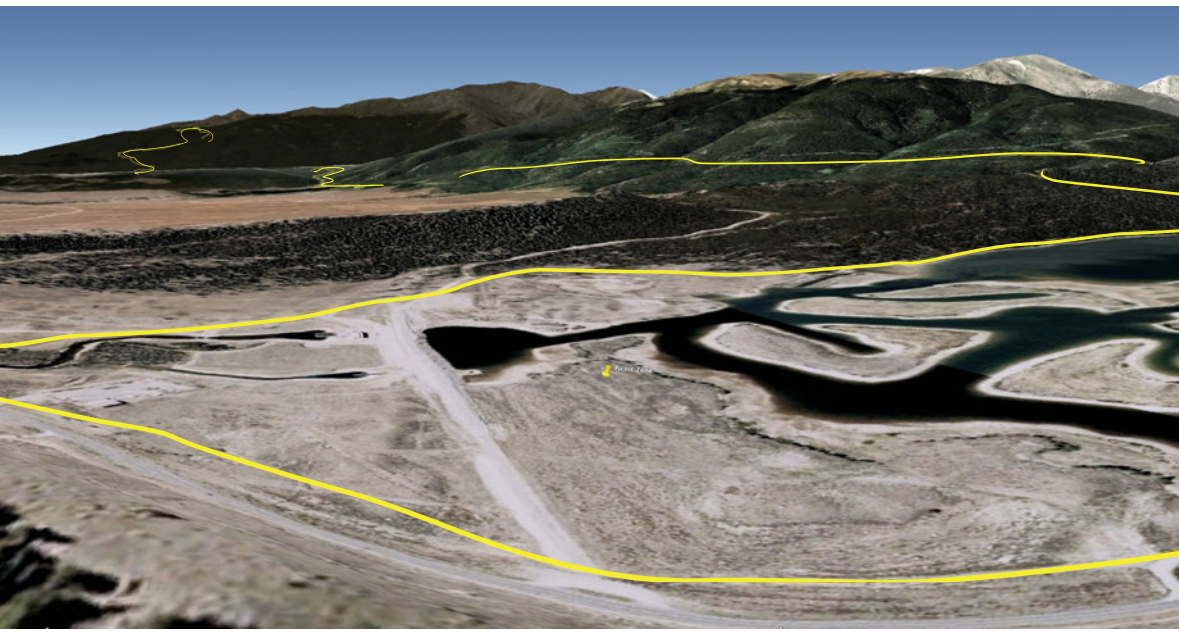
GRANITE, CO
2011

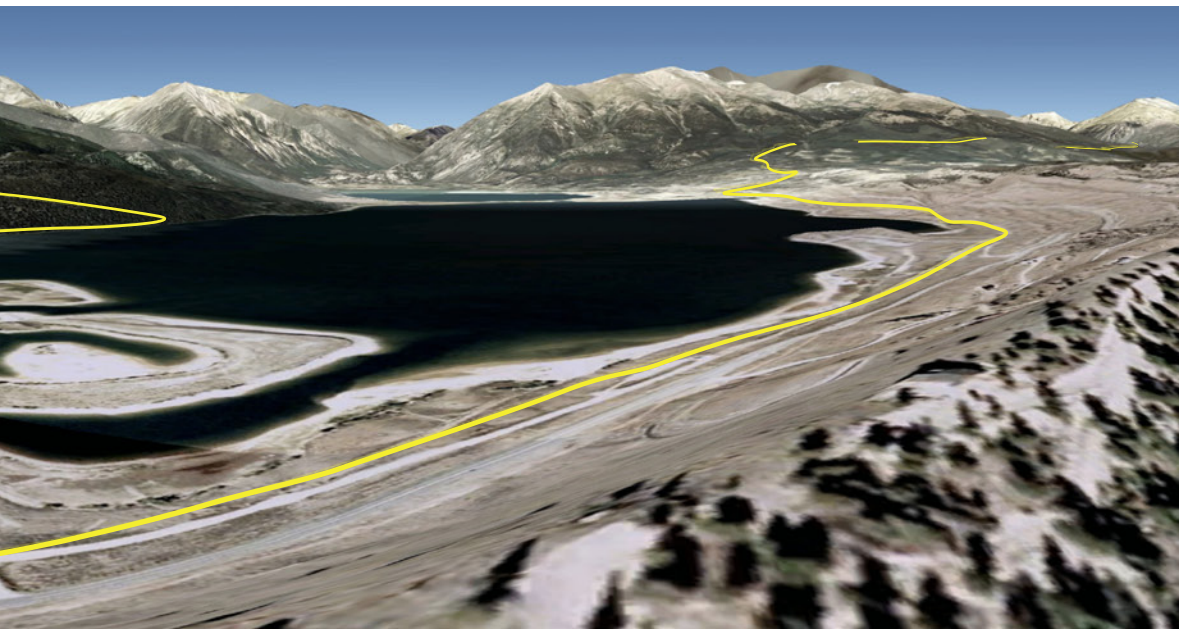
Location:
39° 4’58.09”N 106°18’12.85”W

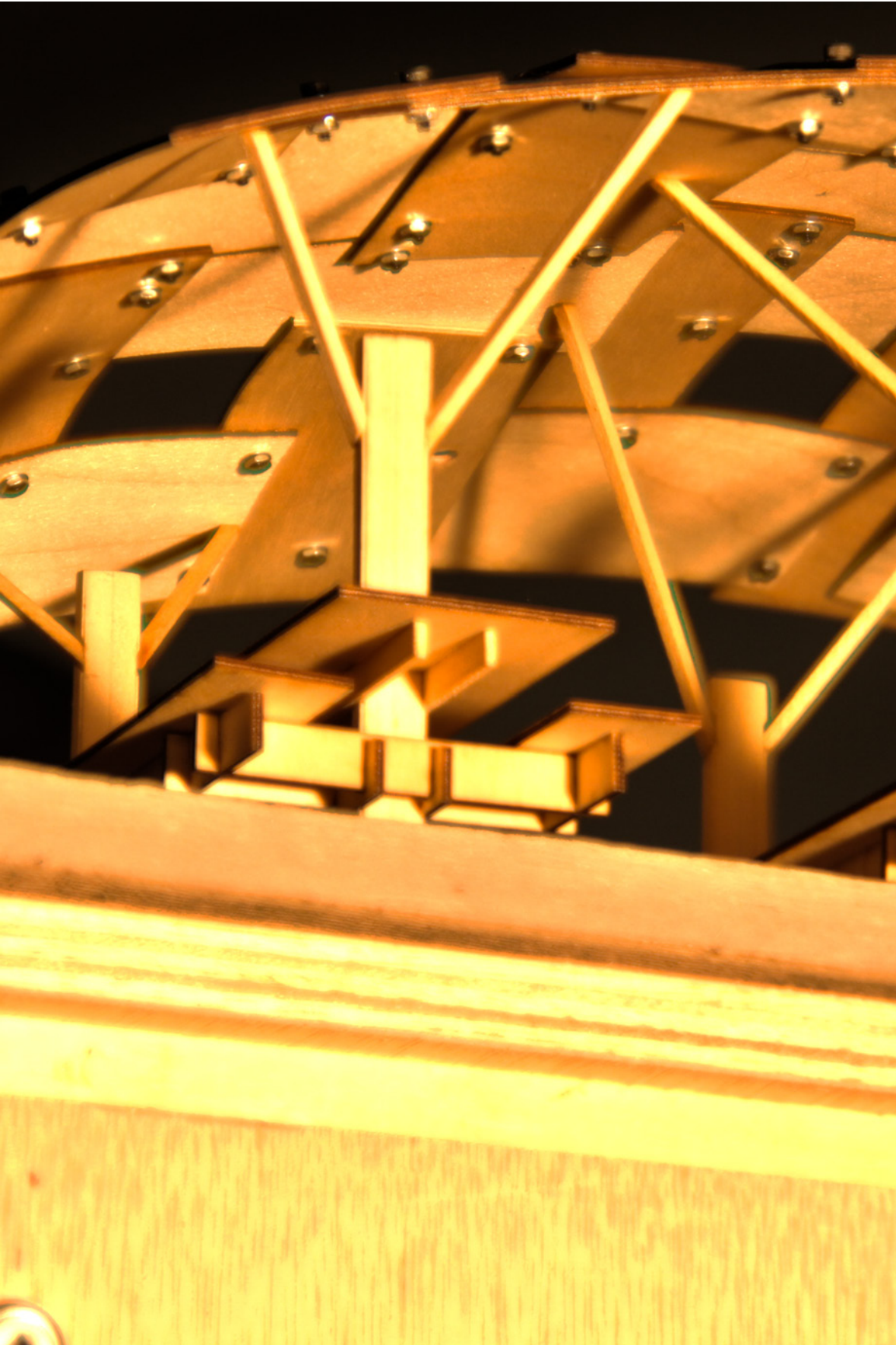
Elevation: 9209 ft.

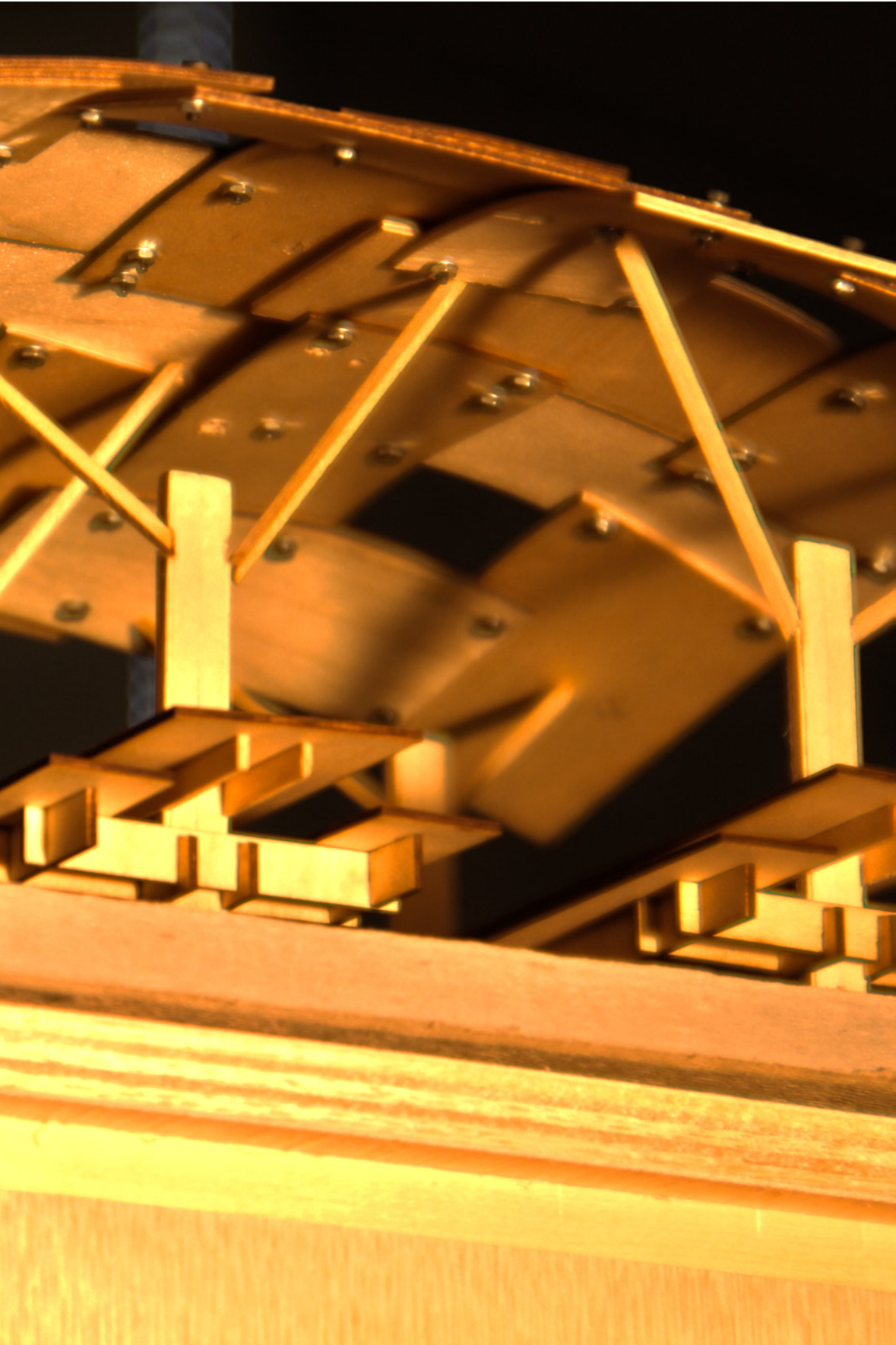




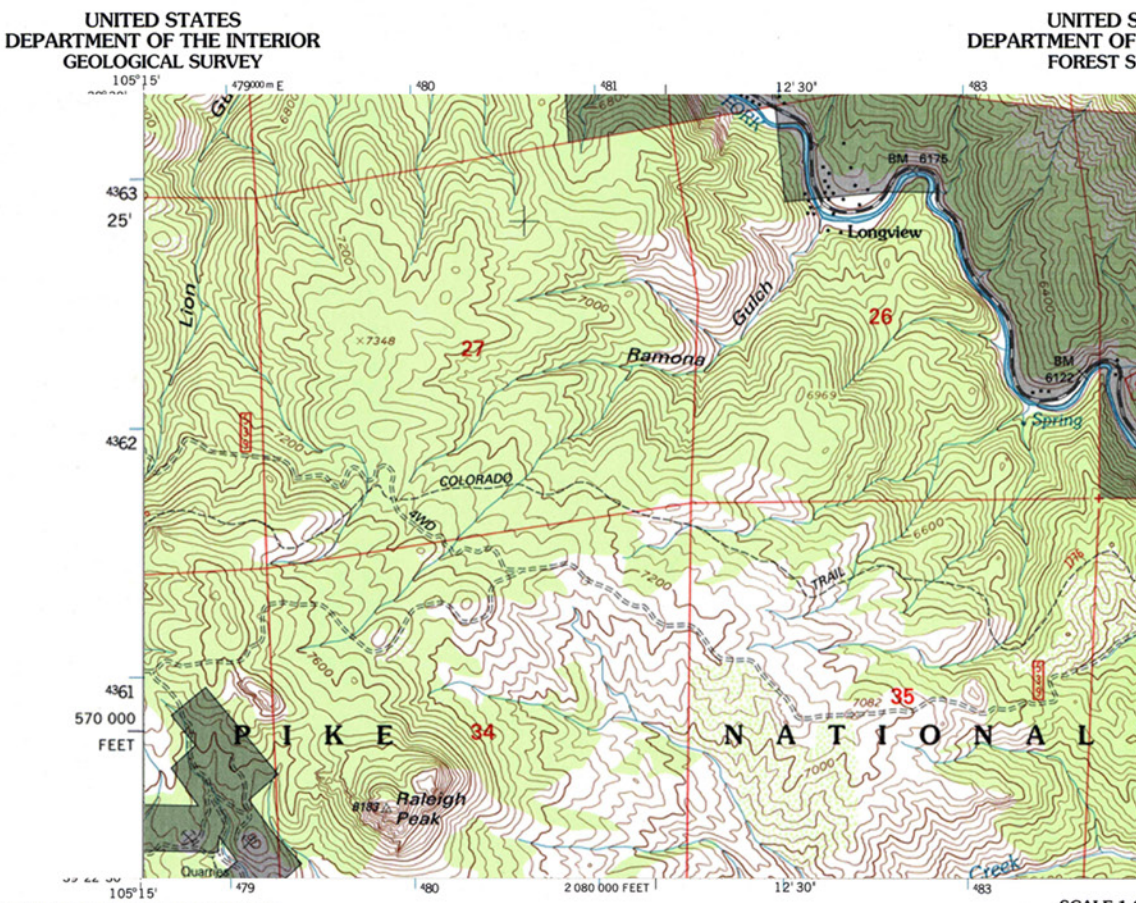


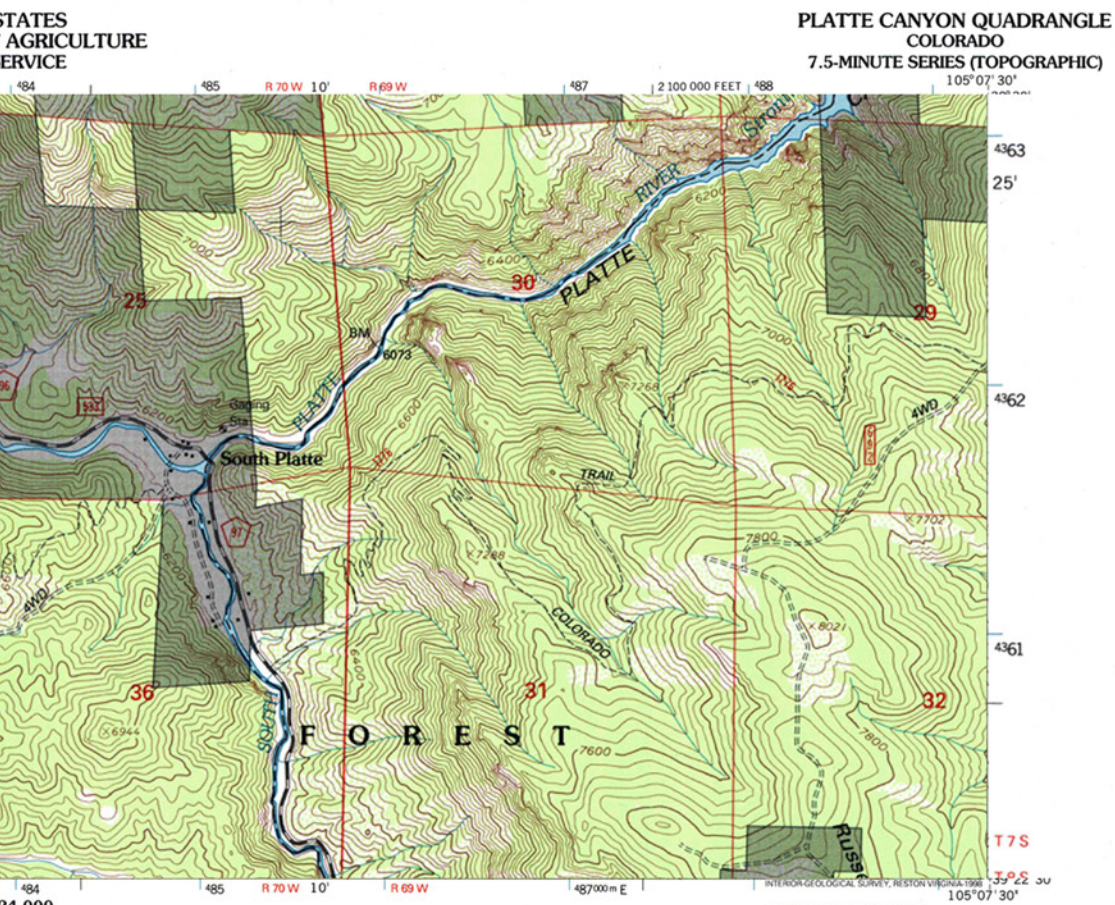






Site 1:
Visitor Center




STATES
AGRICULTURE
ERVICE
PLATTE CANYON QUADRANGLE
COLORADO
7.5-MINUTE SERIES (TOPOGRAPHIC)
105°07' 30"
484
485
R 70 W
10'
R 69 W
487
2 100 000 FEET
488
4363
25'
4362
4361
T 7 S
PLATTE
RIVER
SOUTH
PLATTE
South Platte
Gaging Sta
BM
6073
TRAIL
COLORADO
4WD
25
30
29
36
31
32
FOREST
487000 m E
INTERIOR-GEOLOGICAL SURVEY, RESTON VIRGINIA 1998
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7000
8000
9000
10,000
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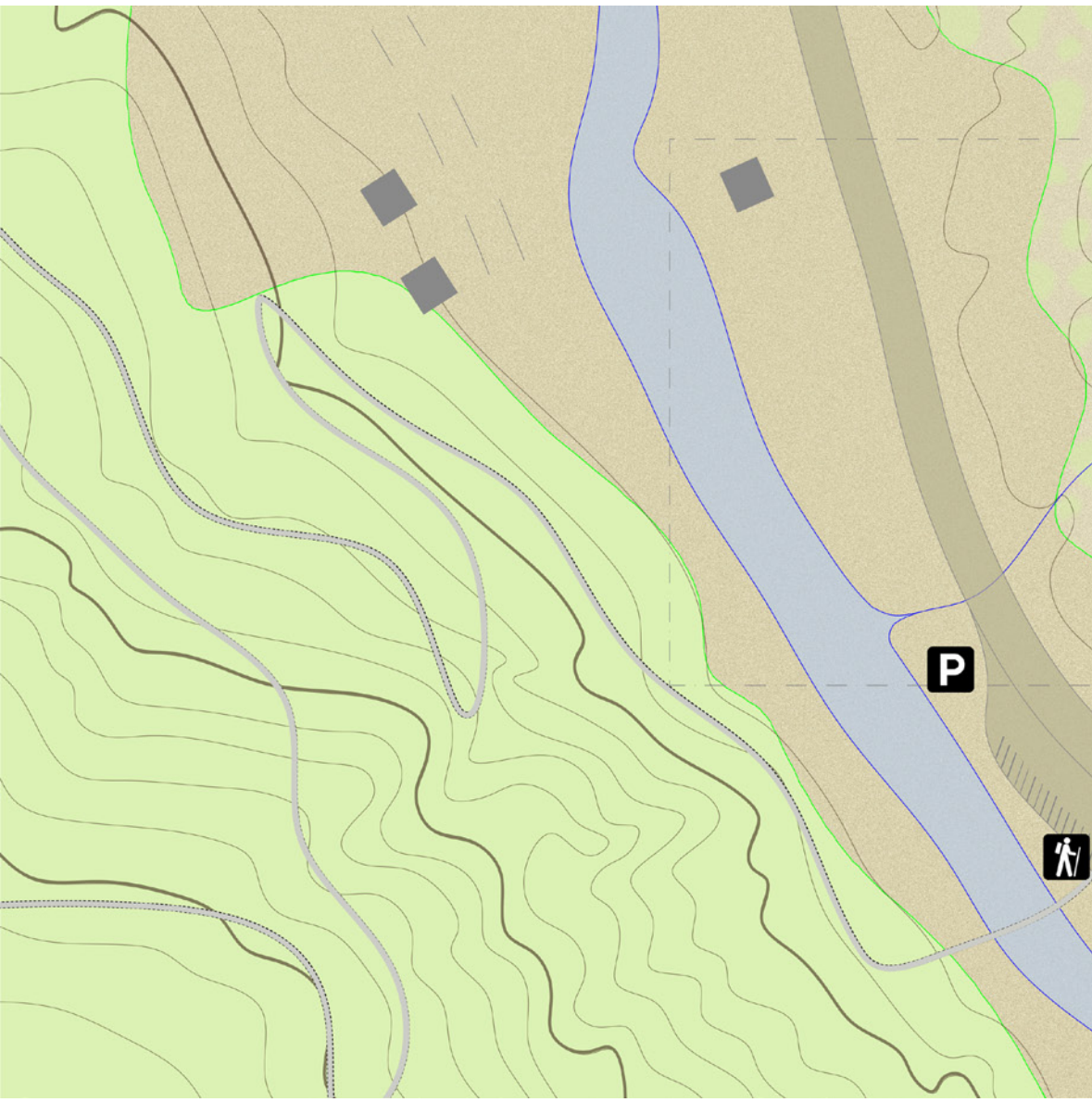
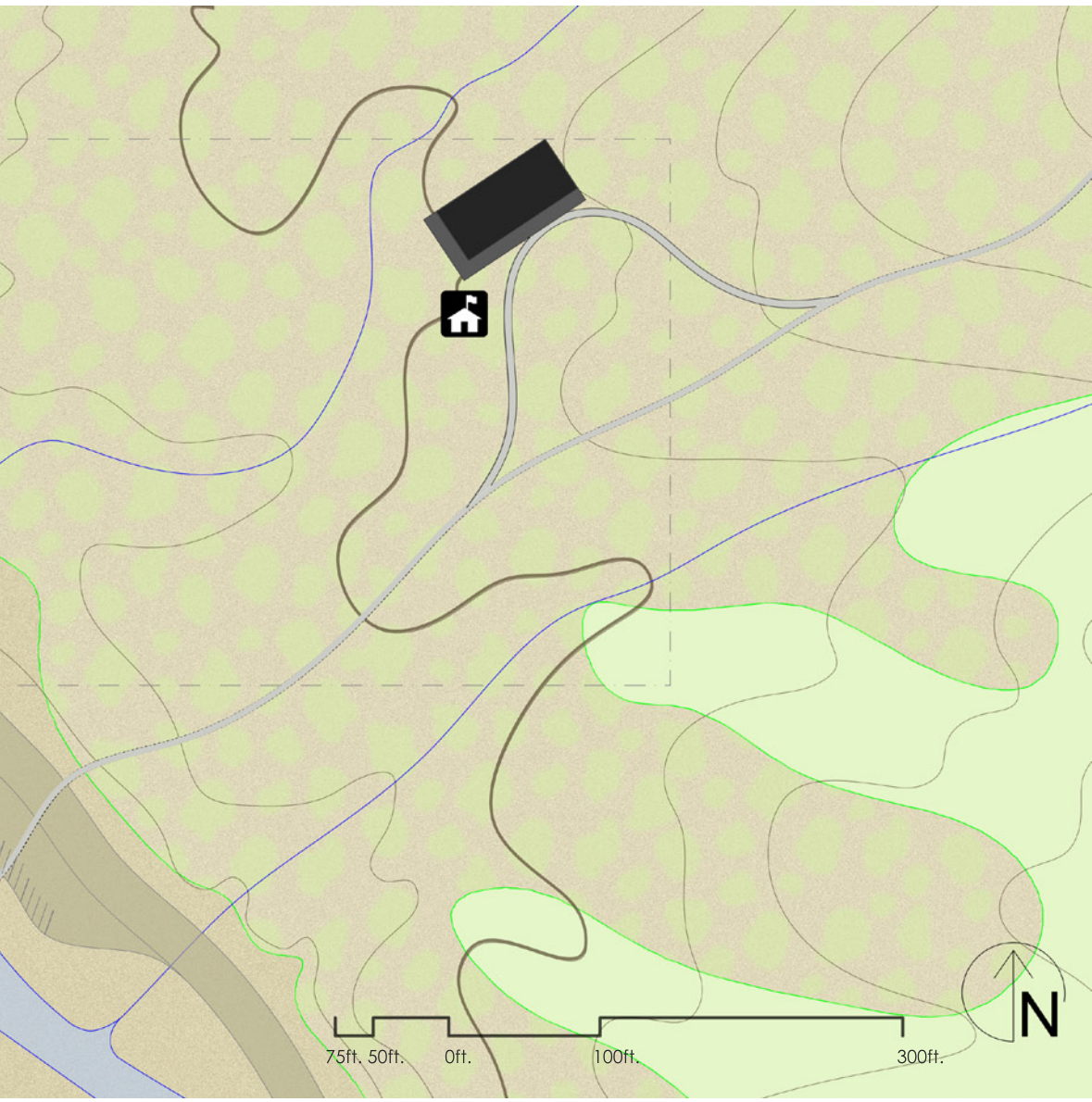
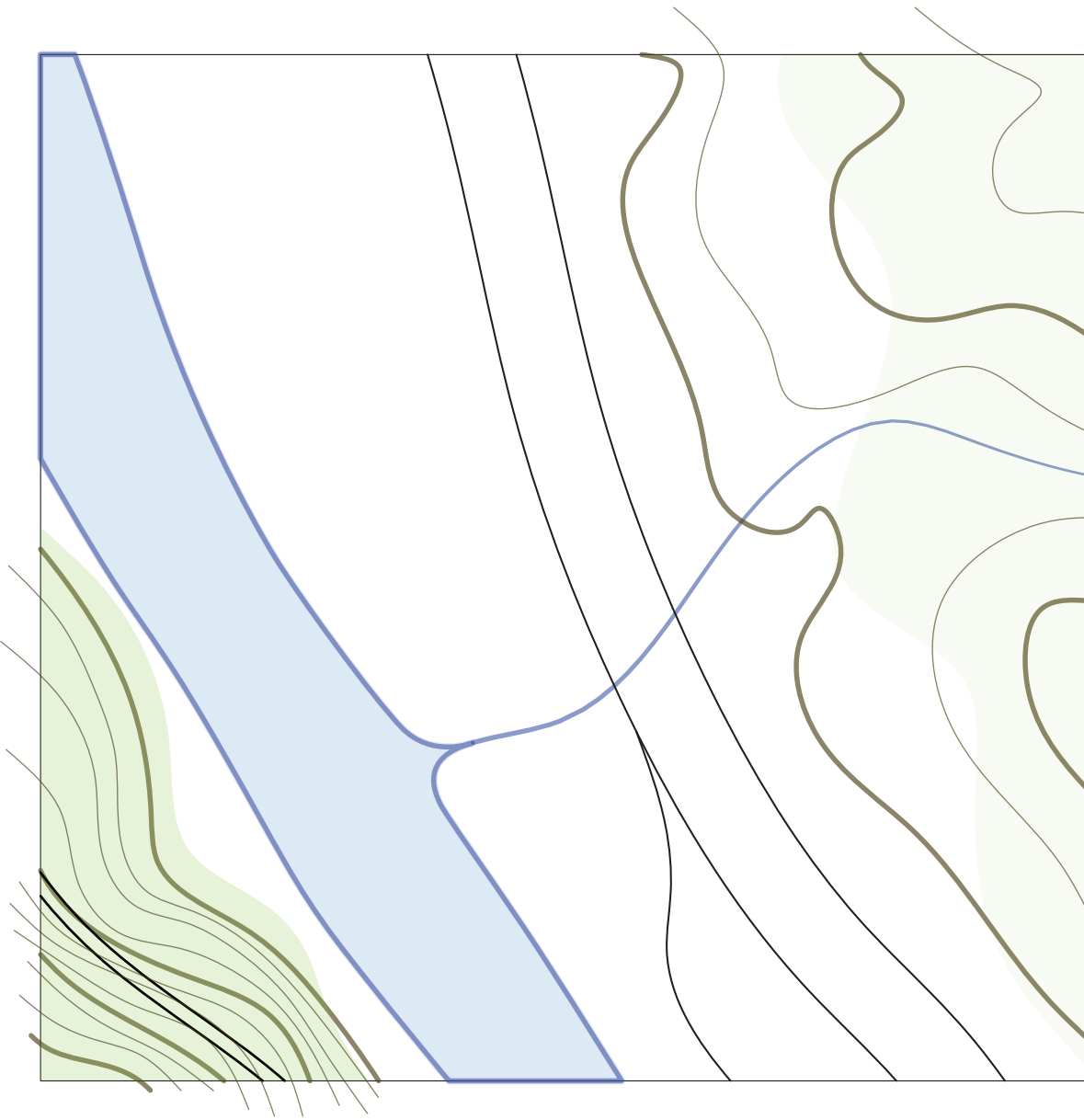
2000
RVAL 40 FEET
TICAL DATUM OF 1929
RS MULTIPLY BY 0.3048
AL MAP ACCURACY STANDARDS
. BOX 25286, DENVER, COLORADO 80225
AND SYMBOLS IS AVAILABLE ON REQUEST
COLORADO
QUADRANGLE LOCATION
1 Conifer
2 Indian Hills
3 Littleton
4 Pine
5 Kassler
6 Green Mountain
7 Deckers
8 Devils Head
ADJOINING 7.5' QUADRANGLES
HIGHWAYS AND ROADS
Interstate
U. S.
State
County
National Forest, suitable for passenger cars
National Forest, suitable for high clearance vehicles
National Forest Trail
Primary highway
Secondary highway
Light-duty road
Composition: Unspecified
Paved
Gravel
Dirt
Unimproved; 4 wheel drive
Trail
Gate; Barrier
PLATTE CANYON, CO
1994
NIMA 4962 I NW - SERIES V877

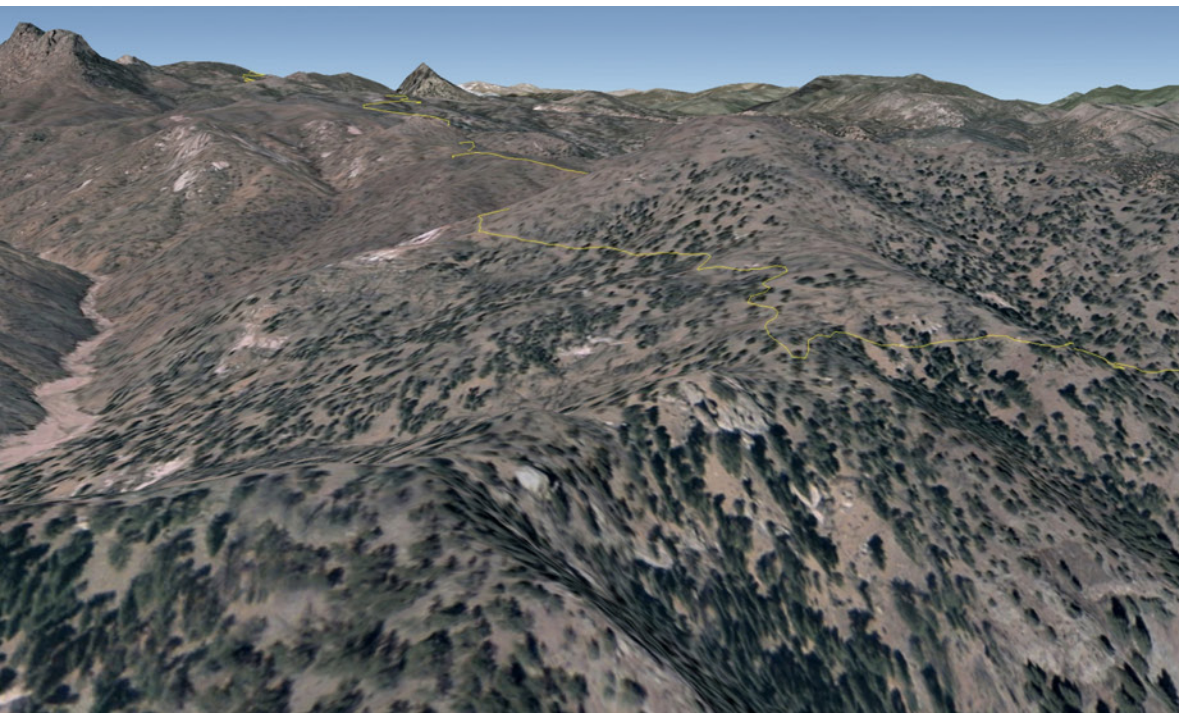
Location:
39°24'03.87'' N 105°10'06.09'' W

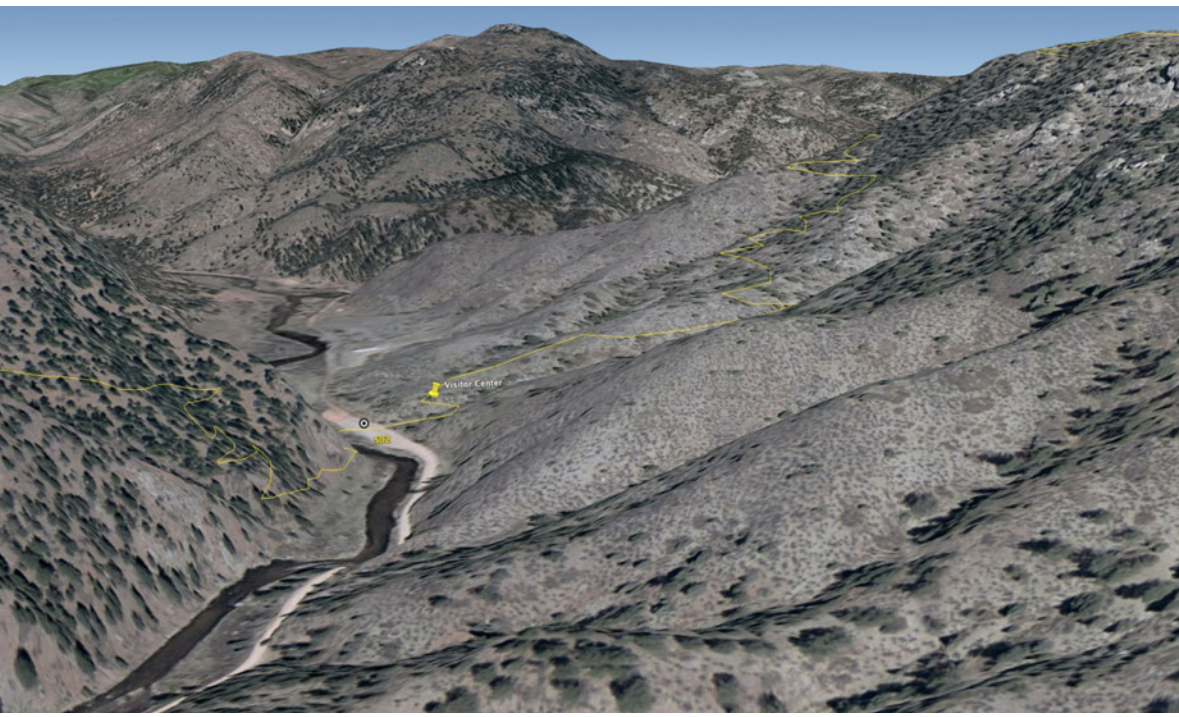


Elevation: 6178 ft.








Visitor Center

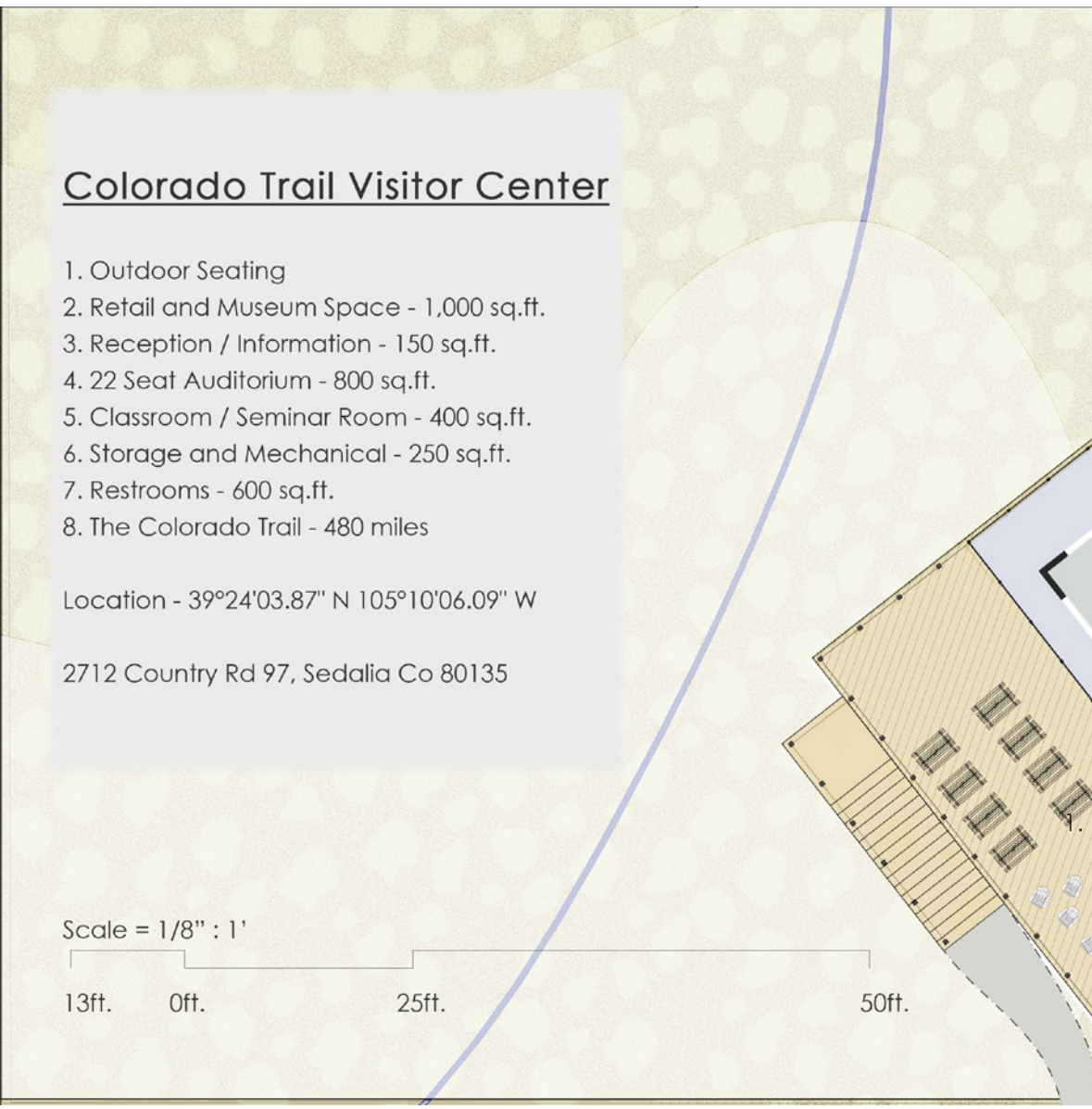
Visitor Center

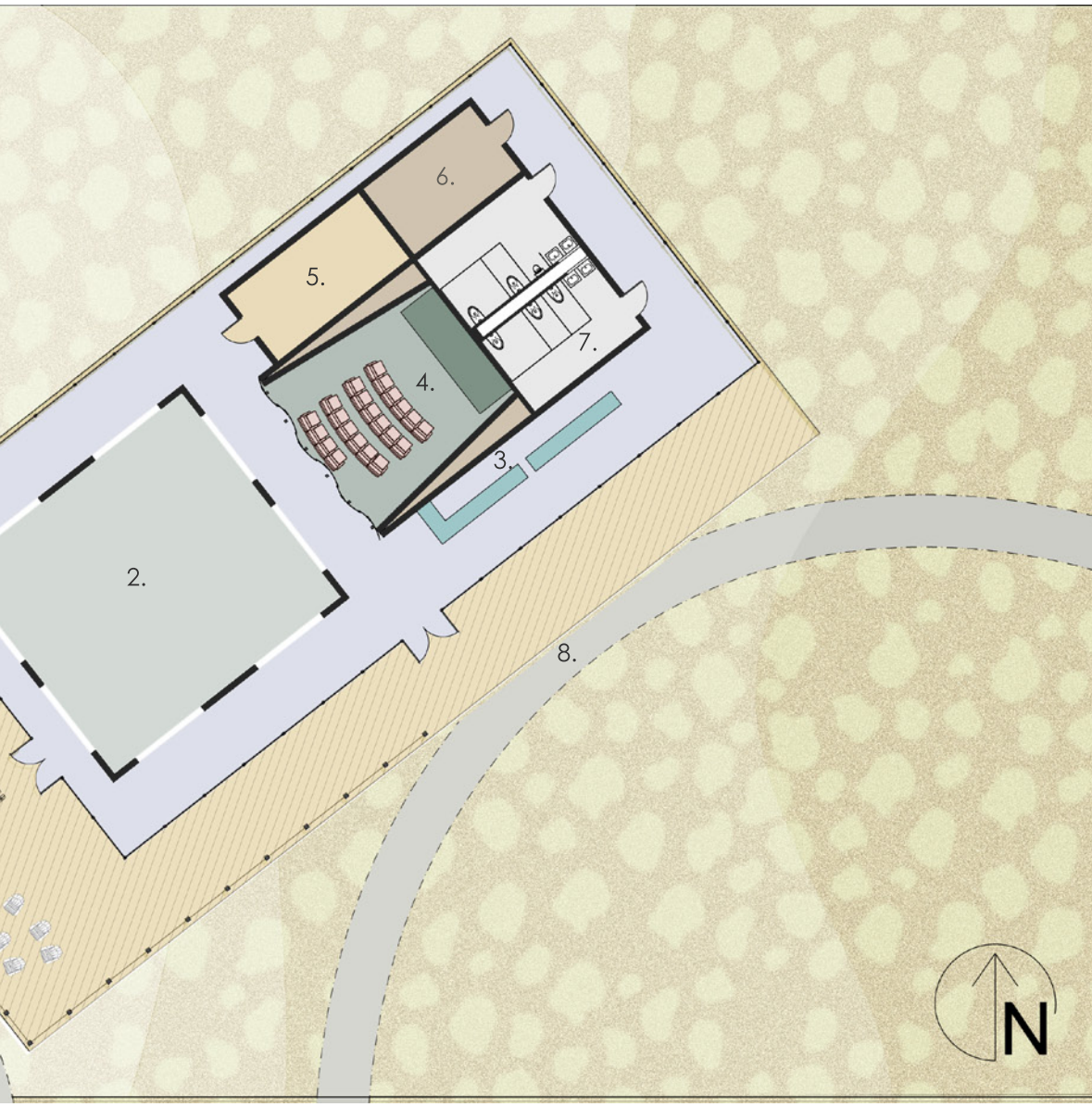
Colorado Trail Visitor Center

1. Outdoor Seating
2. Retail and Museum Space - 1,000 sq.ft.
3. Reception / Information - 150 sq.ft.
4. 22 Seat Auditorium - 800 sq.ft.
5. Classroom / Seminar Room - 400 sq.ft.
6. Storage and Mechanical - 250 sq.ft.
7. Restrooms - 600 sq.ft.
8. The Colorado Trail - 480 miles

Location - 39°24'03.87" N 105°10'06.09" W

2712 Country Rd 97, Sedalia Co 80135

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N

Conclusions

After switching thesis mid-stream and struggling to find my groove for the second half of the first semester, I found my feet, and they happened to be in wooden shoes. I am pleased with the architectural forms that were developed, if not so much the rate at which production occurred.

I learned that after 8 months of dealing in 1/32" plywood and a great deal of sawdust later, I'd be happy as a wood worker or ski tech, or an architectural model builder.

And you can't please everyone all the time, and all those people were at my critique.

Special Thanks

I am pleased to have completed this thesis work, however, I'm sure that without the support of several people, my project would not have reached this level of completion. I would like to thank my parents for their moral and financial support. Studio Wittig provided endless entertainment and sustained energy. My final models were made thanks to Zoyes Creative especially John Peterson who very kindly directed all of my laser work. Finally I would like to thank Will Wittig for his guidance and wisdom throughout the year.

Endnotes

Abstract

1) http://www.pbs.org/art21/artists/serra/clip1.html

Jasper Johns

1) http://www.pbs.org/wnet/americanmasters/episodes/jasper-johns/about-the-painter/54/

2) http://www.moma.org/interactives/exhibitions/1996/johns/

3) http://www.ranker.com/list/jasper-johns-art-and-work-by-this-artist/reference

4) http://www.mollycliffhilts.com/encaustic-technique.php

Richard Serra

1) http://www.moma.org/interactives/exhibitions/2007/serra/serra_checklist.pdf

2) http://www.sfmoma.org/artwork/278

3) http://www.nytimes.com/2003/11/23/arts/art-a-serra-sculpture-emerges-from-its-tomb.html

Making Design

1) Dec. 2010, http://www.cadc.auburn.edu/rural-studio/.

2) Dec. 2010, http://www.cadc.auburn.edu/rural-studio/Default.aspx?path=Gallery/Purpose/History/.

3) The Rural Studio. Dir. Chuck Schultz. 2002. DVD. BluePrint Productions.

4) Toshiko Mori, “Immaterial/Ultramaterial: Architecture, Design, and Materials” (New York, Braziller, 2002) 1.

5) Toshiko 2.
6) Nov. 2010, http://www.pbs.org/art21/artists/serra/clip1.html#.
7) Nov. 2010, http://www.slate.com/id/2167443/slideshow/2167456/entry/2167458/fs/0//.
8) Dec. 2010, http://www.apawood.org/level_b.cfm?content=prd_glu_gen_terms
9) Dec. 2010 http://www.jasper-johns.com/
10) Dec. 2010 http://www.metmuseum.org/toah/hd/john/hd_john.htm.
11) Grunenberg, Kennedy. Material Misuse: Kennedy & Violich Architecture. London: AA publications, 2004.

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Beylerian, George et.al. Ultra Materials. London: Thames & Hudson, 2007.

A study into the tectonics of creating new and meta-materi als. Referenced for tactility of surface and richness of visual impact.

Frampton, Kenneth and John Cava. Studies in Tectonic Culture. Cambridge: MIT Press, 1995.

Referenced for the technique of making architecture in the fashion of craftspersons. The making of architecture is expressly presented as model for technique presented herein.

Grunenberg, Kennedy. Material Misuse: Kennedy & Violich Architecture. London: AA publications, 2004.

Inspiration to create modular panel system. KVA's "misuse" of plywood and gypsum board directly relates to the aspirations of the thesis.

Jordan, Martin. "Back to nature." Therapy Today 20.3 (2009): 26-28. Psychology and Behavioral Sciences Collection. EBSCO. Web. 27 Oct. 2010.

Study of emotional science as tied to our existance in nature. Architecturally significant to bind the interior with the exte rior in order to soothe the occupants and aid mental healing.

Mori, Toshiko. Immaterial/Ultramaterial. Cambridge: Harvard Design School in association with George Braziller, 2002.

Another spark to create interesting material connections. The materials presented are embedded with intricacies that go beyond the visual connection to the pieces.

Stevens, William and Norma Turner. Wood Bending Handbook. Woburn: Woodcraft Supply Corp, 1970.

Handbook for bending wood.

http://arch629lynch.wordpress.com/2010/05/06/hands-are-underrated/