Kim Dupont-Madinier
Portfolio 2024

Developing innovative solutions through new frontiers of technology and design.

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Atelier Dupont-Madinier

Founder

Launched and spearheaded the development of advanced system and assembly designs for off-grid prefab construction to radically decarbonize the building industry. The startup focused on two strategic avenues to launch the building technology through two variations of Whisper House.

The first initiative focused on selling the groundbreaking autonomous prototype homes as a work of art through a laboratory of design, Atelier Dupont-Madinier. The lab worked at the intersection of cutting-edge materials and industrial technologies to crafting unique autonomous residencies.

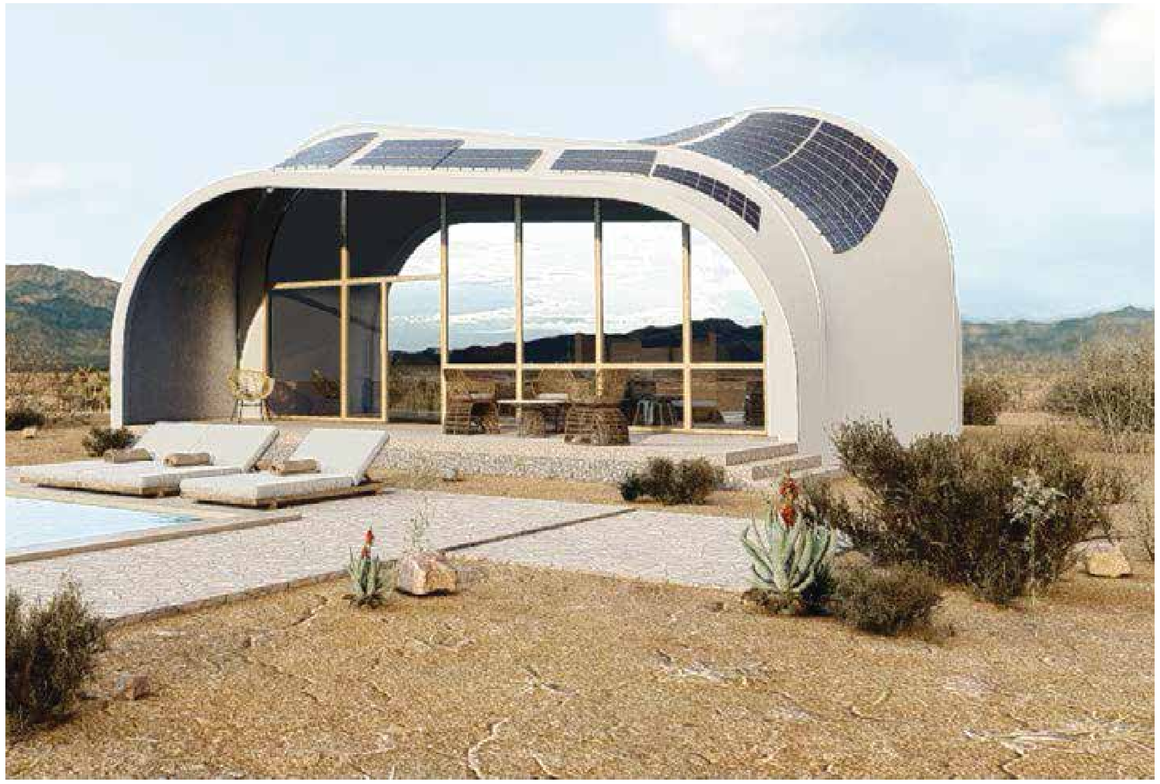
The second intiative focused on a strategic corporate partnership with Touchplan, a construction management software company. The partnership aimed to validate Whisper House's business model and value chain argument through a radically simplified demountable home while customizing Touchplan's construction management software for future prefab customers.

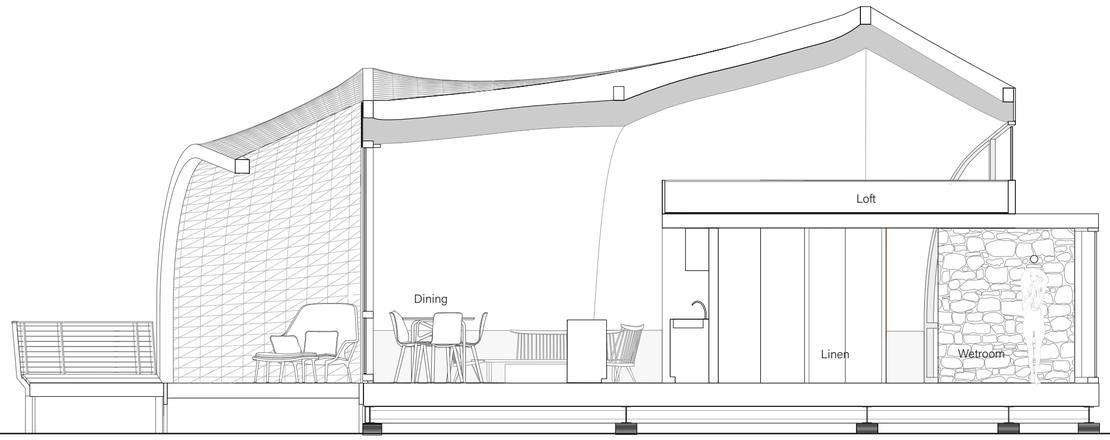
Sep. 2021 - Dec. 2023, Boston MA & Scottsdale AZ, USA

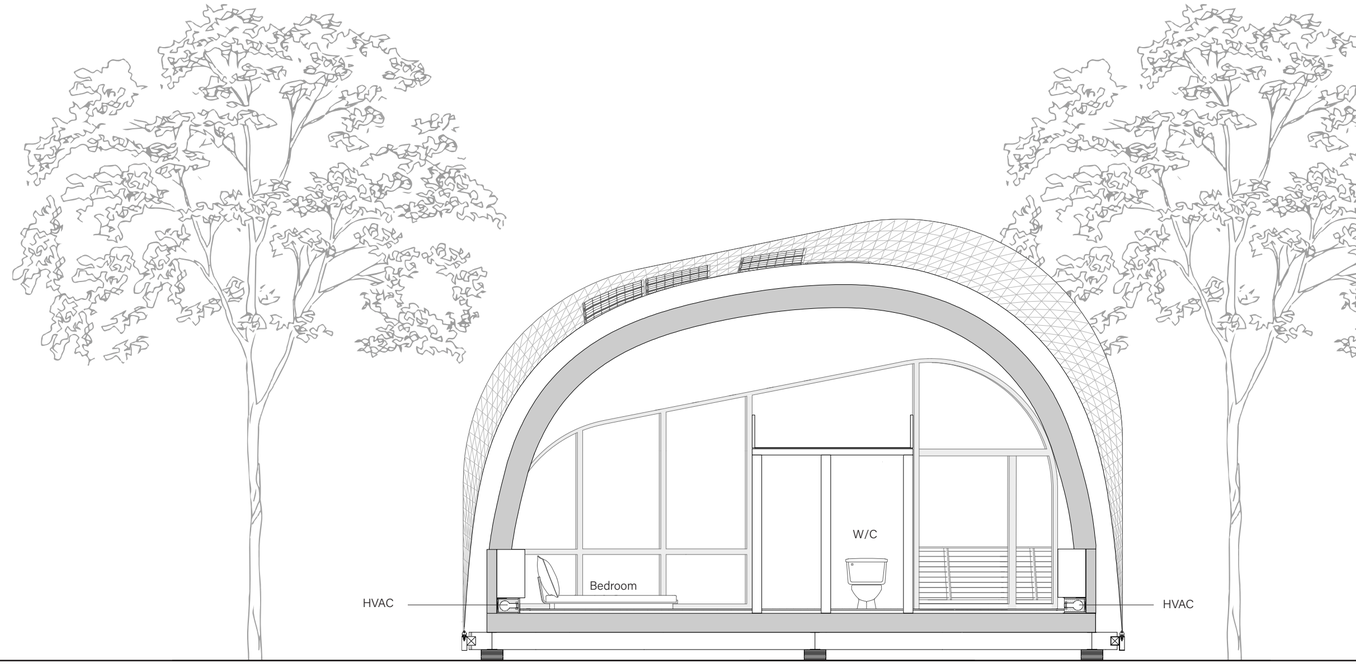
Reimagining A Discipline

These unique autonomous homes are a reference for the simplicity of their construction and differentiated design.

Theses autnomous homes are at the leading edge of our changing housing paradigm as not only a model of energy efficiency, but an elegant piece of design as well. By combining advancted light weight materials and next generation assembly methods, these lightweight, open, and elegant textile Passive House homes are setting the stage for new frontiers of technology and design.







Precision Engineering

Through elegant design and precision engineering, the autonomous homes are exceeding traditional Passive House construction practices, offering a 90% reduction in carbon footprint* offering improved continuity and building comfort. The highly engineered bio-mimetic building enveloped is paired with customized mechanical system, providing a self-sustaining off-grid home optimized for multiple climate zones.

* with reference to operational load of the building's mechanial systems

Interior Rendering of Living Room

Cutting-Edge Technology

Our cutting-edge technology and technical ingenuity is optimize to meet one of our valuable possessions - time. Equipped with highly engineered systems and simplified assembly methods, our uniform building technology provides a 12x faster on-site build, leveraging precision engineering with pragmatic and accesbile excution practices to provide a high-quality project execution.

Unique Aesthetic

Whispe House is a minimalistic Scandinavian design focused on a high-quality experience, prioritizing specialized vendors offering artisanal craftsmanship and sculpted high-performing finishes. The unique material selection brings to life a next generation architectural space that creates both a visual and sensory based harmonious space. The signature design - offering a futuristic combination of style and simplicity.

Interior Rendering of Loft

Interior Rendering of Bathroom

Limited Selection

Whisper House was sold a limited edition autnomous house. With each house we offered an exclusive one-of-a kind experience tailor made for intuitive futurists who seek to be at the forefront of our changing housing paradigm. These homes offered an unparalled lifestyle creating stronger connection with naturee, while providing a stronger sense of privacy and exclusivity.

Interior Renders for Bedroom (top) and Loft (bottom)

Whisper House Specifications

Gross Built Area
2500 SF

Building Footprint
1200 SF

Floor to Ceiling Windows
590 SF

Max Ceiling Height
18 SF

Thermal Resistance
R 51, highly resistant to external temperatures

Hurricane Resistance
Category 4, maximum wind speeds of 130-156mph / 209-251 km/h

Snow loads
Pass

Indoor Fire Resistance
M0, exceeding fire resistance of traditional light-weight gypsum

Indoor Fire Resistance
Class A, exceeding fire resistance of traditional 3-ply roofing shingles

Sound Insulation
37cB, soundproofed quiet room

Energy-Efficiency Standard
Net-Zero

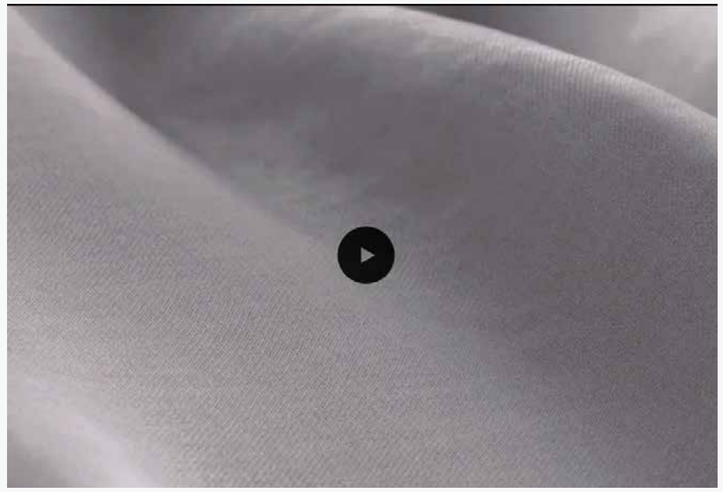
PV System
5000 Wp, supporting energy needs for building operations

Annual Heating Demand
4231.056 BTU/SF

Annual Cooling Demand
1706.07 BTU/SF

Airtightness
0.6(1/h) ACH, premium standard for airtightness

DUPONT-MADINIER



MENU

WORK
ABOUT
PRESS
OTHER

Atelier Dupont-Madinier is a laboratory for design that seamlessly combines engineering and art to build unique energy-efficient off-gird homes that are a reference for the simplicity of their construction and differentiated designs.

L'OUEVRE, PARADISE VALLEY, AZ, USA

DUPONT-MADINIER

ARTIST'S STORY

ABOUT

REIMAGINING A DISCIPLINE

With over a decade of experience in a wide range of fabrication techniques, scientific research, and social impact initiatives – ATELIER DUPONT-MADINIER's Founder, Kim Dupont-Madinier, has been re-imagining the architectural discipline – reviving artisanal practices in combination with new frontiers of technology and design.

UI/UX Design

A harbinger of environmentally conscious design, Atelier Dupont-Madinier offered a new spin on experiential art and sustainable architecture. The following was the webdesign for the innovative housing solution.

DUPONT-MADINIER

L'OUEVRE

WORK

BACK TO THE FUTURE

What if you could live in art? Where art could be more than just an aesthetic piece in your home – but instead a profound experience rooted in the philosophy of sustainable ancient ideals and new schools of thought. A harbinger of environmentally conscious design, ATELIER DUPONT-MADINIER is innovating upon century old skills inspired by principles of ancient crafts, spiritual practices, and new frontiers in textile design in pursuit of defining a new vocabulary of experiential art and textile architecture.

DUPONT-MADINIER

ARCHITECTURAL ADVENTURES

PRESS

CONVERTING ALCHEMY INTO CHEMISTRY

"A MORE NATURAL AESTHETIC THAT STILL MEETS DEMANDING ENERGY STANDARDS. "

March 20, 2014

" NOT ONLY A MODEL OF ENERGY EFFICIENCY BUT AN ELEGANT PIECE OF DESIGN AS WELL."

July 23, 2014

"SEAMLESSLY COMBINING... ENGINEERING AND ART."

October 31, 2014

Product Demo Video

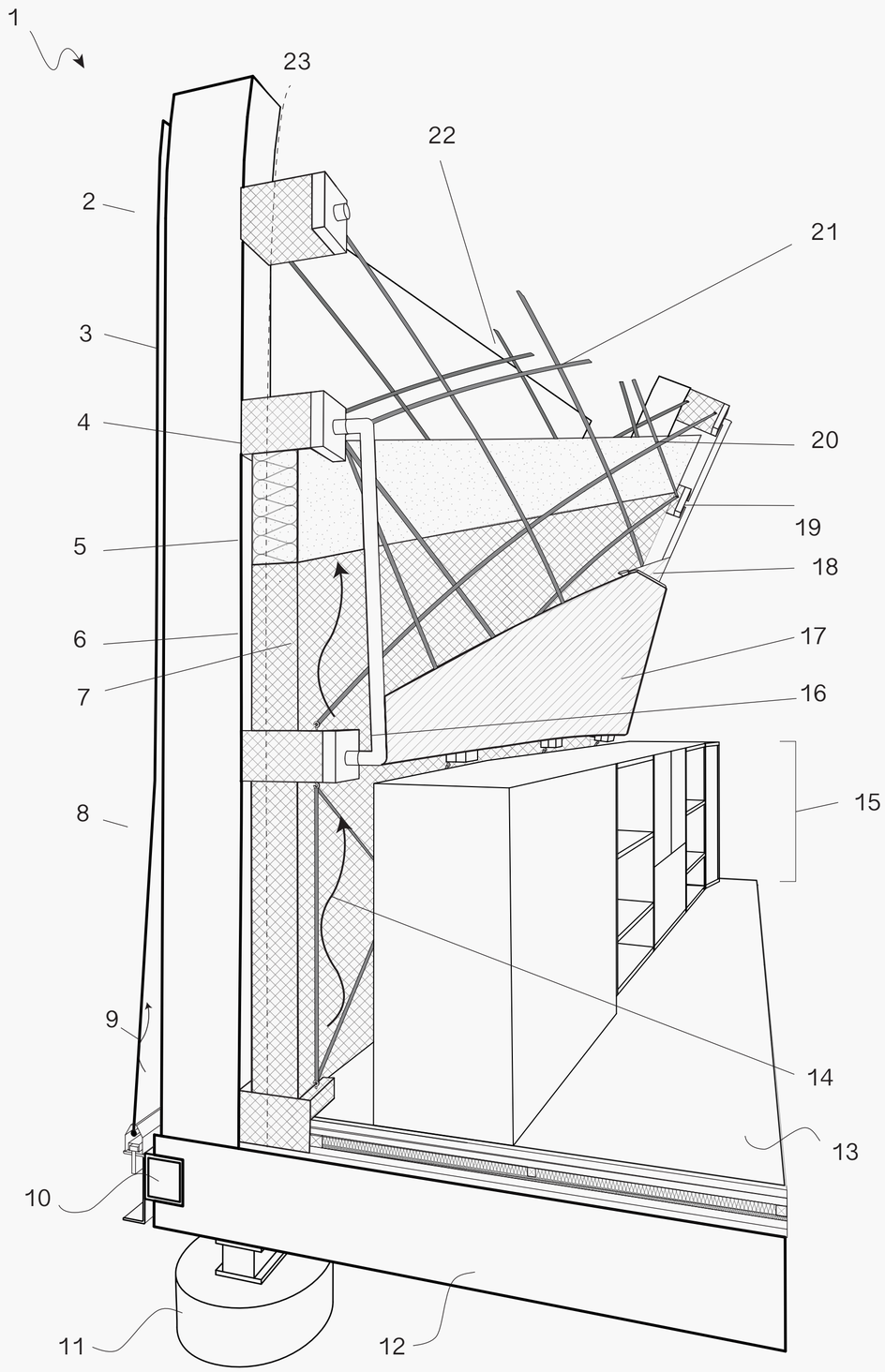
Propietary Patented Technology

Inventor

Patent Number	Title	Description
US-20230340779-A1	Lightweight Building Assembly	Flexible prefabricated insulated building envelope system leveraging advanced materials and building science practices for faster off-site and on-site assembly globally.

Key

1 Lightweight Building Assembly
2 First Membrane
3 Steel Structure
4 Insulation Base
5 Insulation
6 Insulation Blanket
7 Insulation Blanket Membrane
8 Peripheral Wall Portion
9 Ventilation Channel Between First Membrane And Insulation
10 Differential Light Weight Assembly
11 Foundation
12 Steel Structure
13 Panelized Finish Floor
14 Ventilation Channel Between Second Membrane And Insulation Blanket
15 Offset From Ground (2-3ft)
16 Frame
17 Second Membrane
18 Peripheral Wall Portion
19 Frame
20 Plurality of Tensioned Elements
21 Continuous Tensioned Cicuit
22 Plurality of Tensioned Elements
23 Insulation Blanket



Roof Section

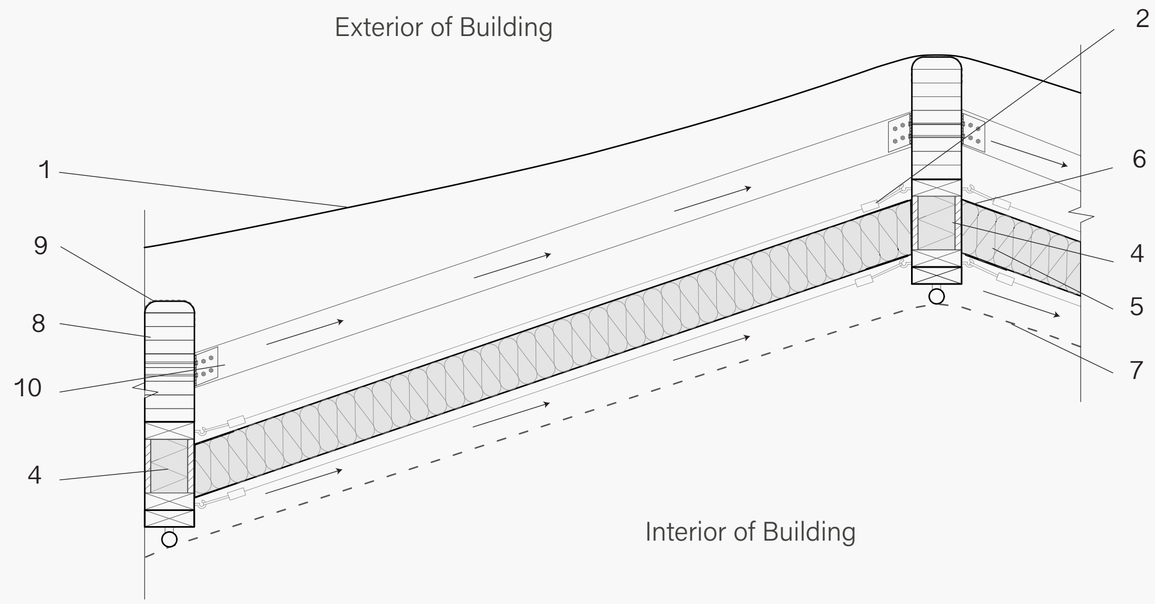
Inventor

Description

Roof Cross Section demonstrating the interior and exterior ventilation strategy around the sealed insulated quilt for Passive House energy, air, and moisture management.

Key

1 Sheerfill II
2 Fiberglass Structural Frame
3 Ratchet Straps
4 Sealed Insulation Block
5 Insulation Quilt
6 Welded Seam
7 QED Advanced Functional Fabric
8 Unalam Arch
9 ETFE Tape
10 Brasing Between Unalam Beams



Le Maison Demountable

The simple genius of La Maision Demountable de Jean Prouve lies in its its ease of portability, simplicitiy and practicallity of construction.
For the strategic partnership with Touchplan, the objective was to combined my patented technology with Prouve's simplified housing typology to validate the technology's buisness model with Touchplan Construction Software.

Exterior Photograph of an Orignial Jean Prouve Maison Demountable

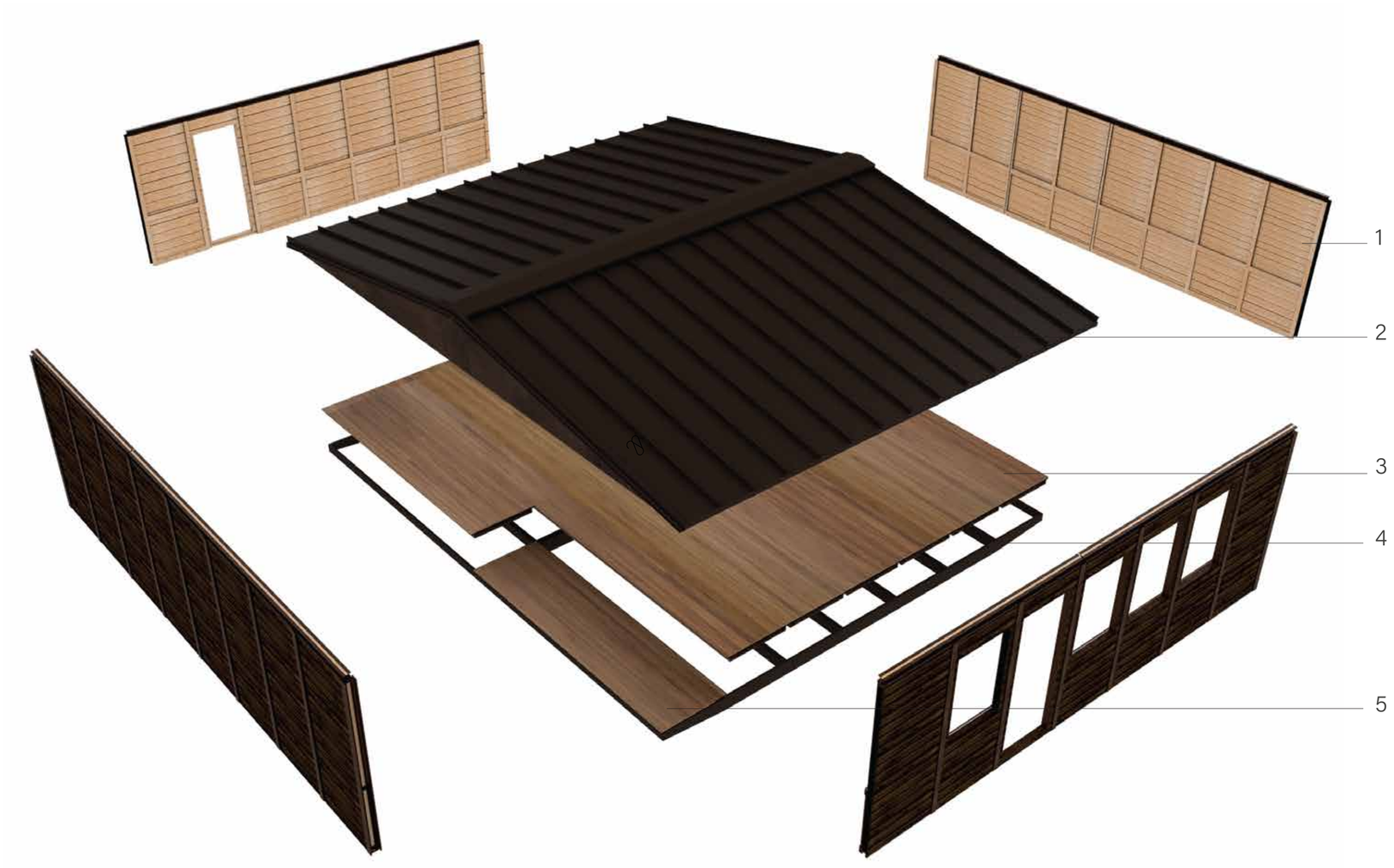
Axon for Panelized Housing Solution

Description

Adaptaption of Jean Prouve's Maison Demountable - integrating my patented technology of advanced materials and assemblies fror global prefab implimentation.

Key

1 Panelized Wall System
2 Panelized Roof System
3 Panelized Floor System
4 Steel Frame
5 Individual Floor Panel



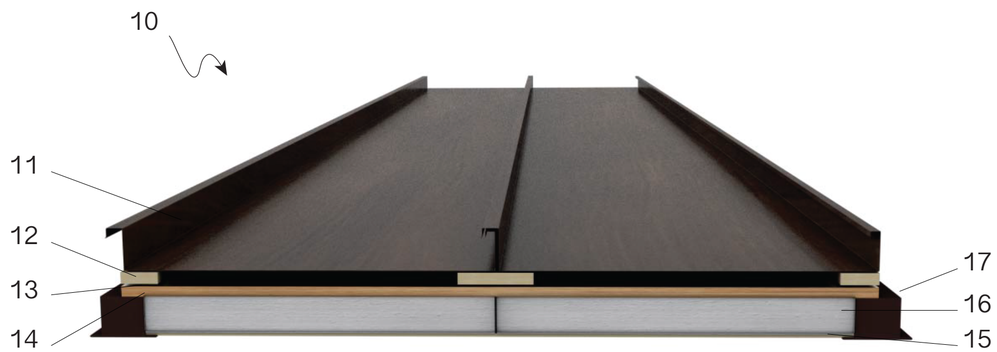
Detail of Lightwieght Panelized Housing

Key

1 Panelized Prouve Floor Assembly
2 Rolled Formed Steel
3 Oak Hardwood Flooring
4 Insulated Quilt
5 Prouvé Demountable Base Frame Structure
6 Prouvé Demountable Base Frame Structure
7 3/4" Advantech Subflooring
8 Pressure Treated Wood
9 3/4" Advantech Subflooring

10 Panelized Prouve Roof Assembly
11 Metal Standing Seam Finish
12 Pressure Treated Wood Battens for Ventilation
13 Winterguard Enderlayment
14 3/4" OSB Sheathing
15 Tatami Rolled Matt
16 Insulated Quilt
17 Prouvé Demountable Steel Cross Bracing

18 Panelized Prouve Wall Assembly
19 Shiplap Interior Finish - Vertical
20 Custom Roll Formed Clip for Base
21 Insulated Quilt
22 Wainscot Trim
23 Batten
24 Shiplap Interior Finish - Horizontal
25 Custom Prouve Roll Formed Attachment for the Roof



Interior Photograph of an Orignial Jean Prouve Maison Demountable

Elegant Simplicity

Prouve's prefabricated house was a quick and elegant solution to the housing crisis that emerged from WWII. The housing solution played a signficant role in the development of systems for mass production in post-war France. As result, the desgin was the perfect baseline to validate my the lightweight building asssembly in partnership with Touchplan.

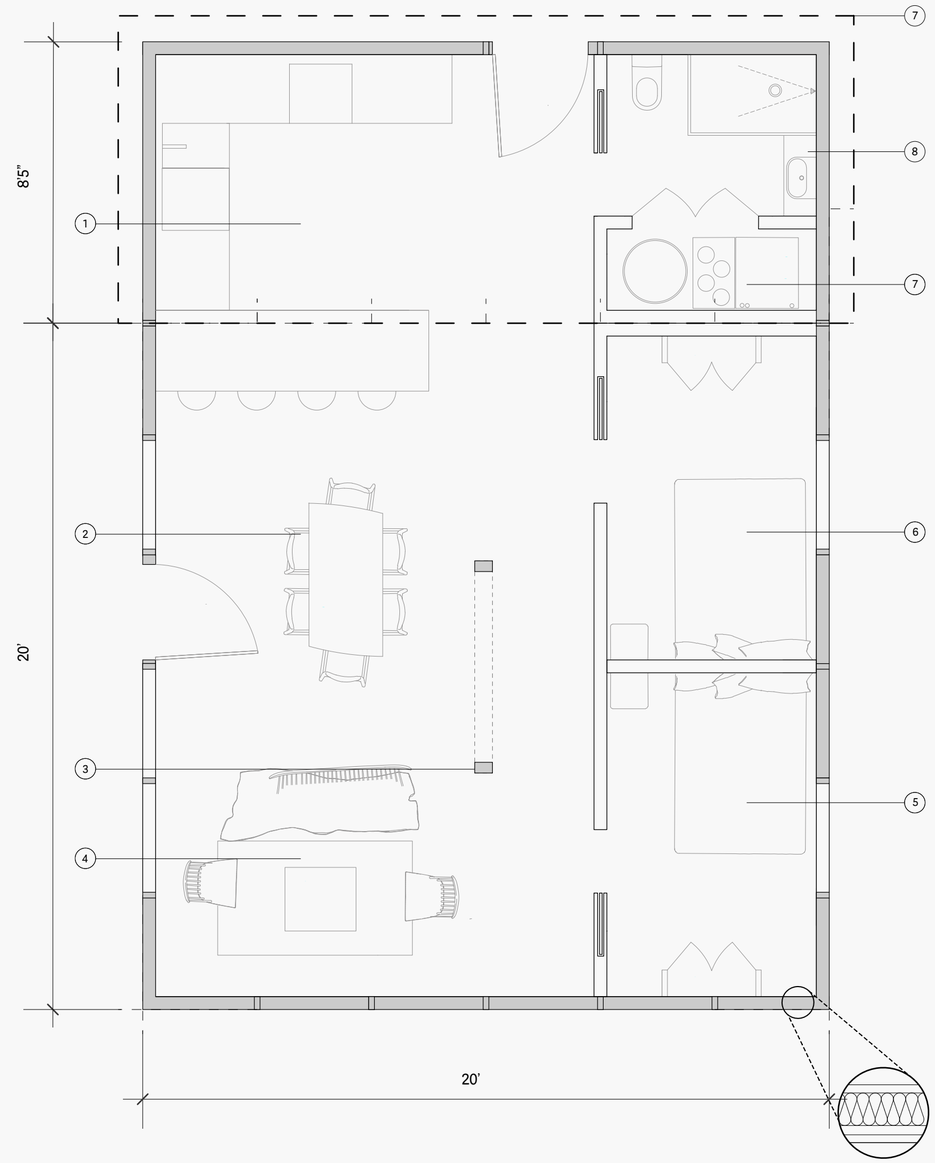
Floor Plan

Description

Stackable Floorplan

Key

1 Kitchen
2 Dining
3 Cloumns/ Demountable Arch
4 Living Room
5 Bedroom 1
6 Bedroom 2
7 HVAC + plumbing add on Unit
8 Bathroom
9 Stackable Mechanical Core (Add on)



Stackable Design

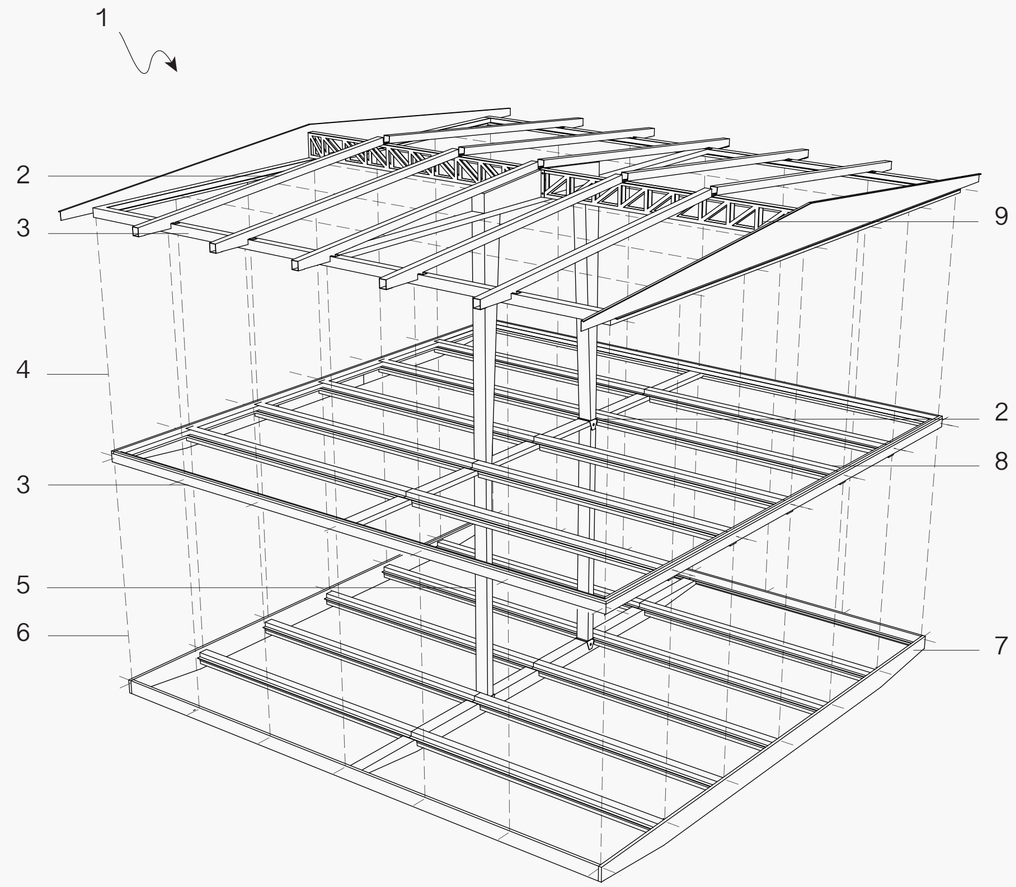
Description

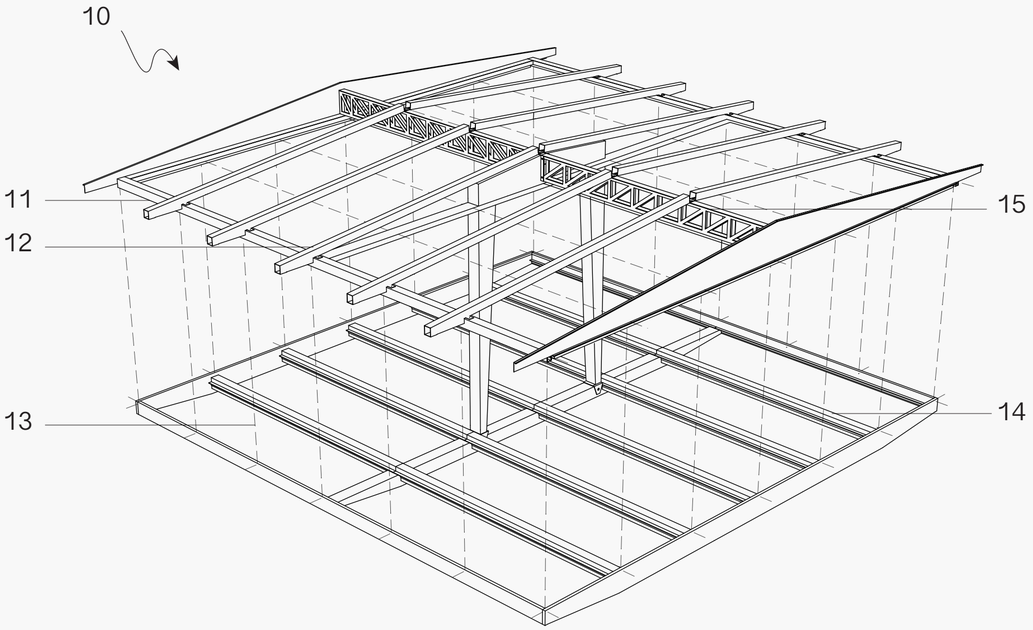
The steel frame design is a
stacable housing solution for
mutli-unit construction.

Key

1 Prouve House Structural Diagram - Stacked Two Stories
2 Custom Roof Purlins
3 Custom Purlins for Snap-in Wall System
4 Mid-Strength Panelized Load Bearing Walls
5 Demountable Base Pillar Structure
6 High-Strength Panelized Load Bearing Walls
7 Base Frame System
8 Second Story Frame Structure
9 Foldable Cross Bracing Trust System

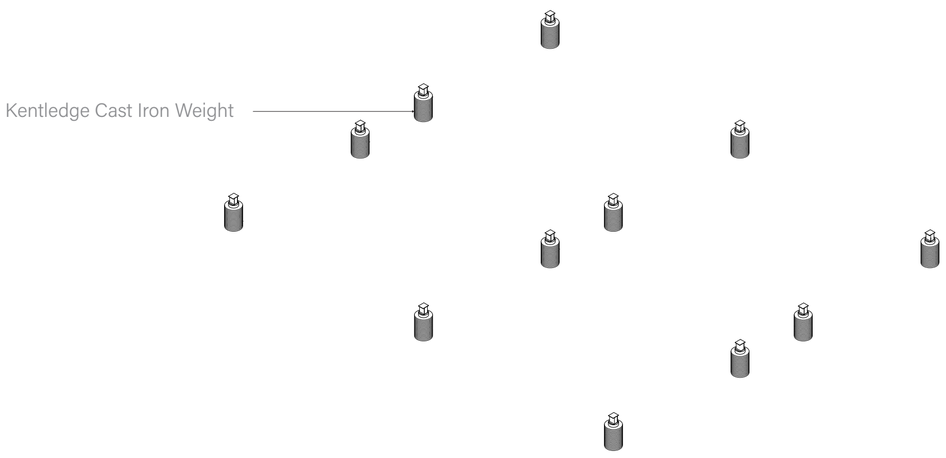
10 Prouve House Structural Diagram - Stacked One Story
11 Custom Purlins for Snap-in Wall System
12 Custom Roof Purlins
13 Mid-Strength Panelized Load Bearing Walls
14 Base Frame System
15 Foldable Cross Bracing Trust System



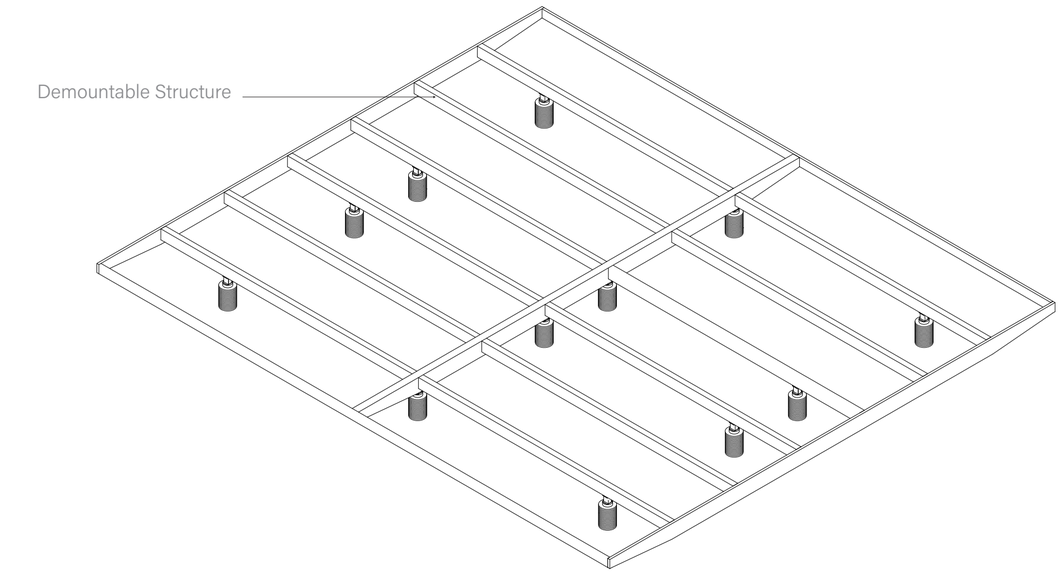


Construction Sequence

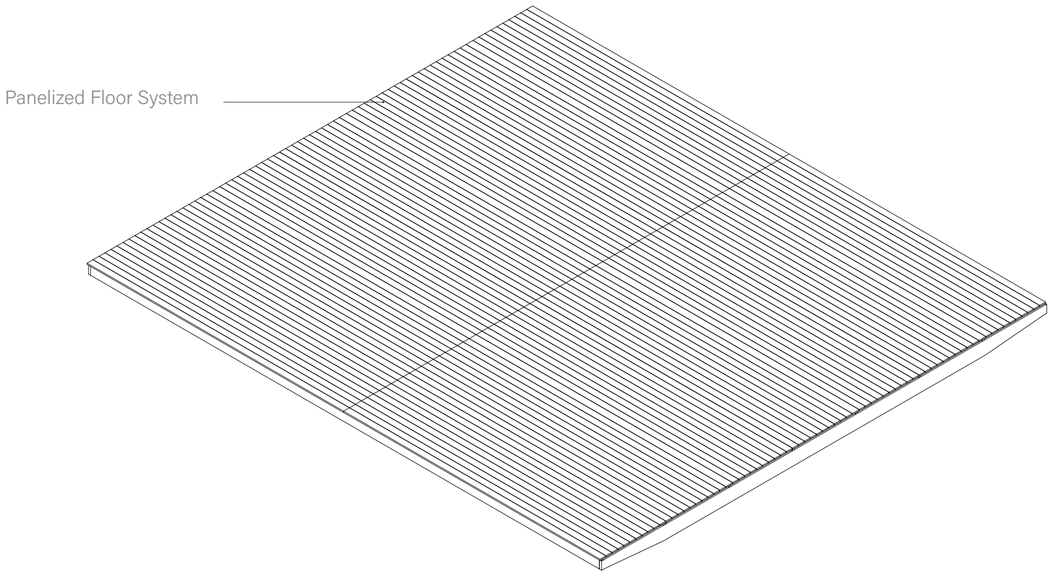
1 Demountable Foundation



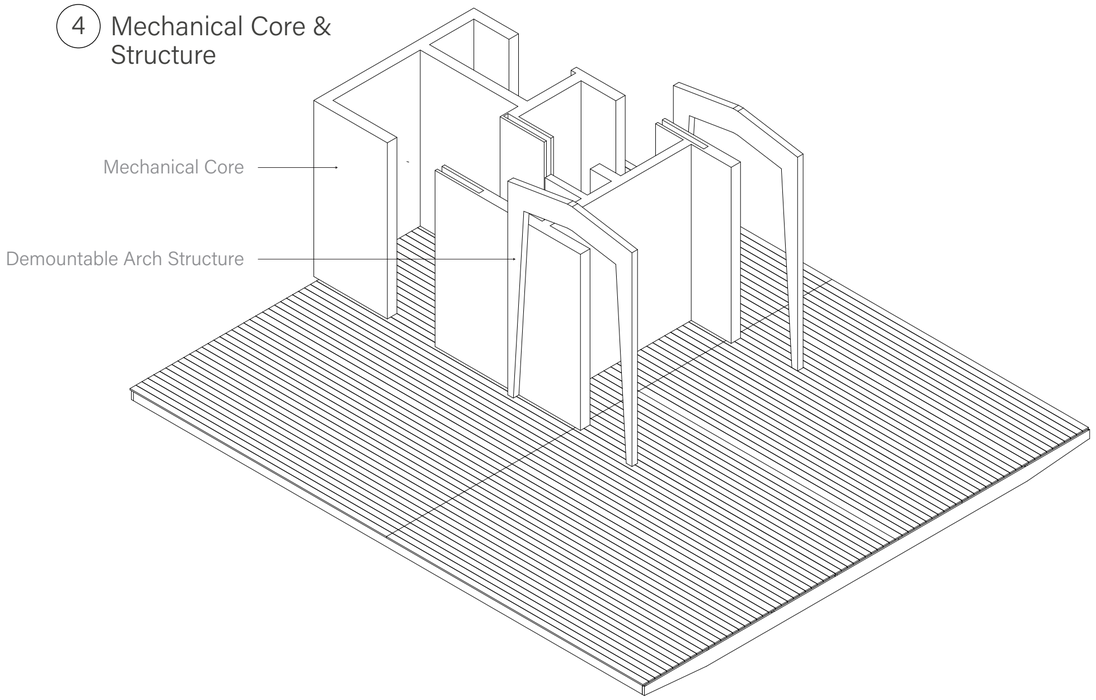
2 Structural Base



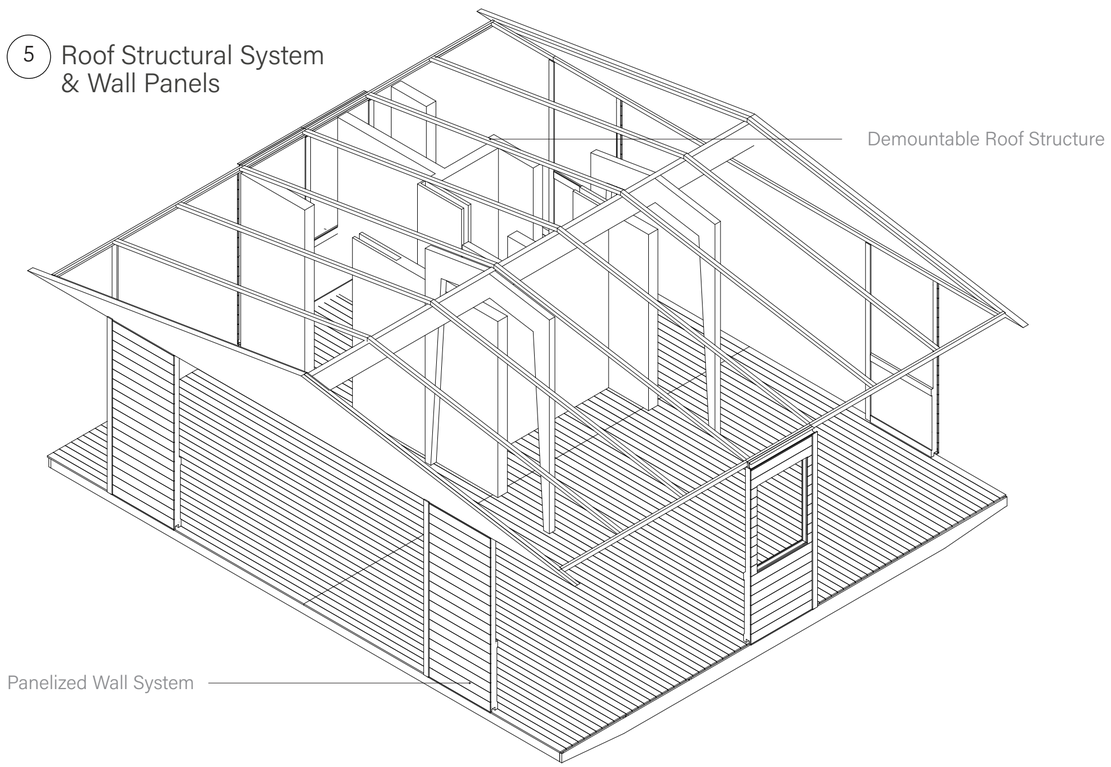
3 Panelized Floor



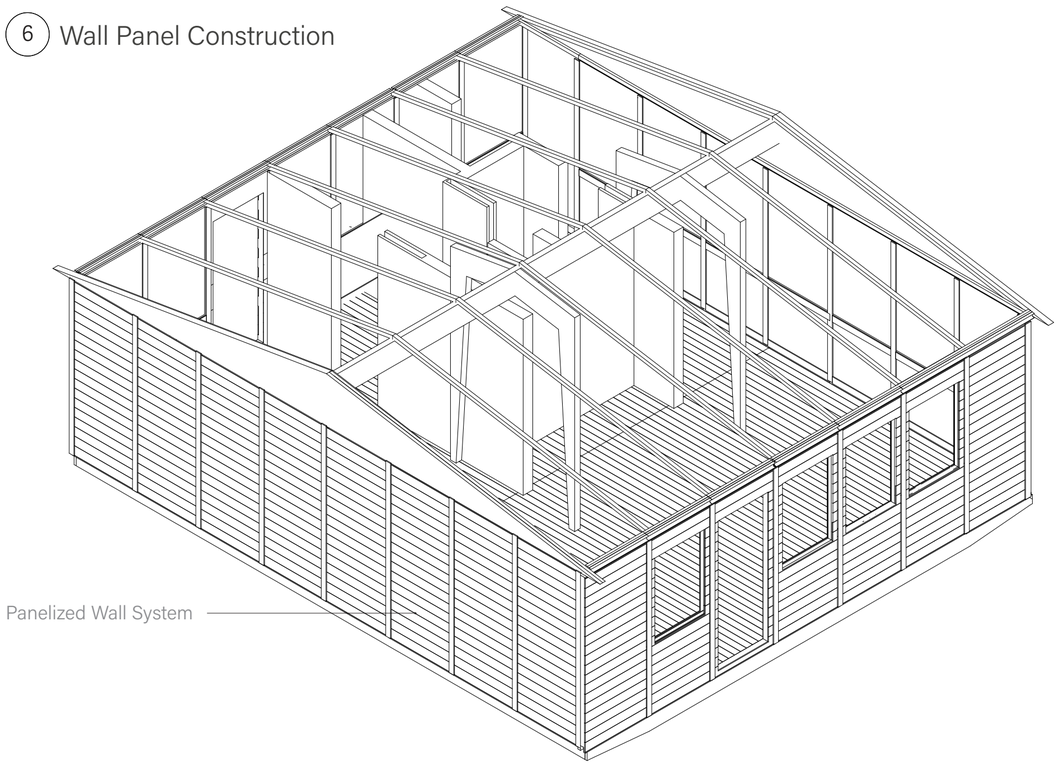
4 Mechanical Core & Structure



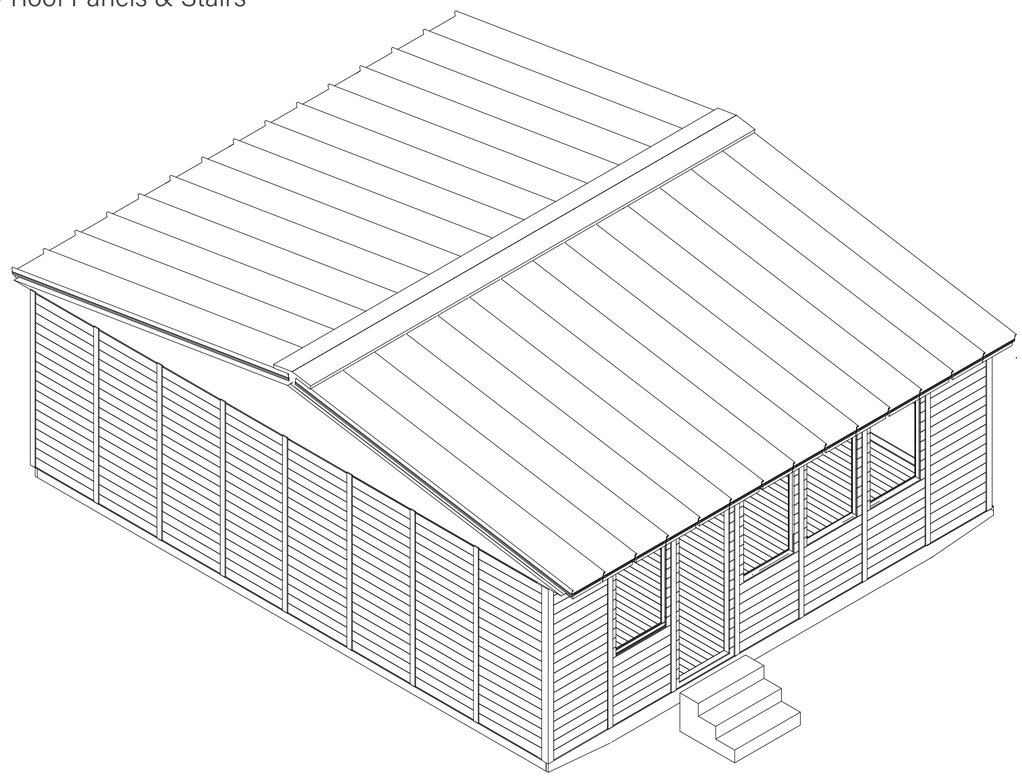
5 Roof Structural System & Wall Panels



6 Wall Panel Construction



7 Roof Panels & Stairs



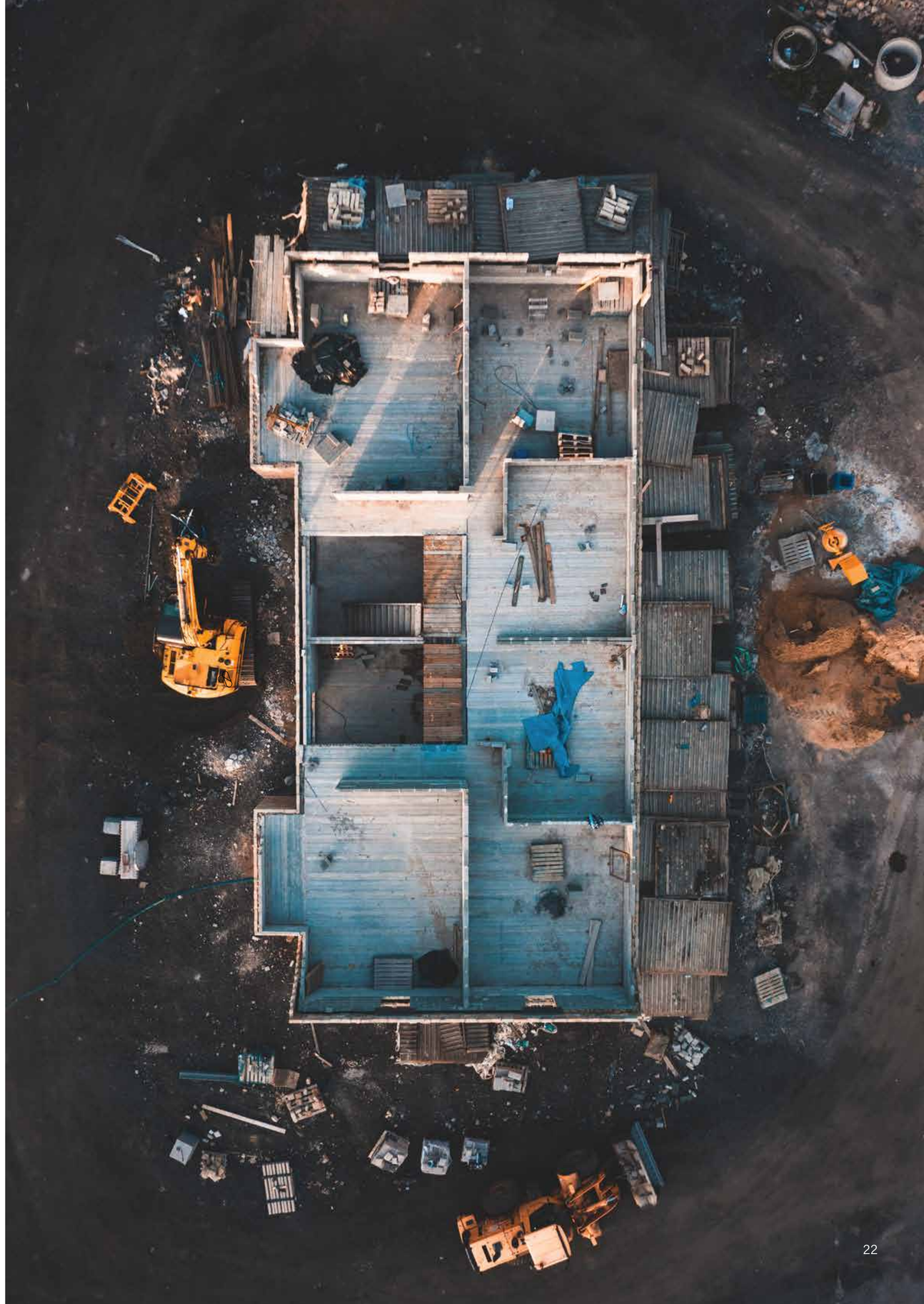
Saint-Gobain

Lead Design Engineer

As the world's largest building material manufacturer, Saint-Gobain is a French multinational corporation that designs, manufactures, and distributes materials and services for construction and industrial markets. The organization's mission is to become the worldwide leader in light and sustainable construction.

As the Lead Design Engineer for the CertainTeed & Unity JV, I was responsible for building out CertainTeed's R&D Design Platform in addition to adapting Saint-Gobain's product portfolio for the off-site Construction, focusing specifically on panelized prefab homes for the U.S. single family residential market. Due to the confidential nature of the work, the following pages consist only of published patents due to confidentiality requirements.

Sep. 2015 - Apr. 2021, Northboro MA. USA



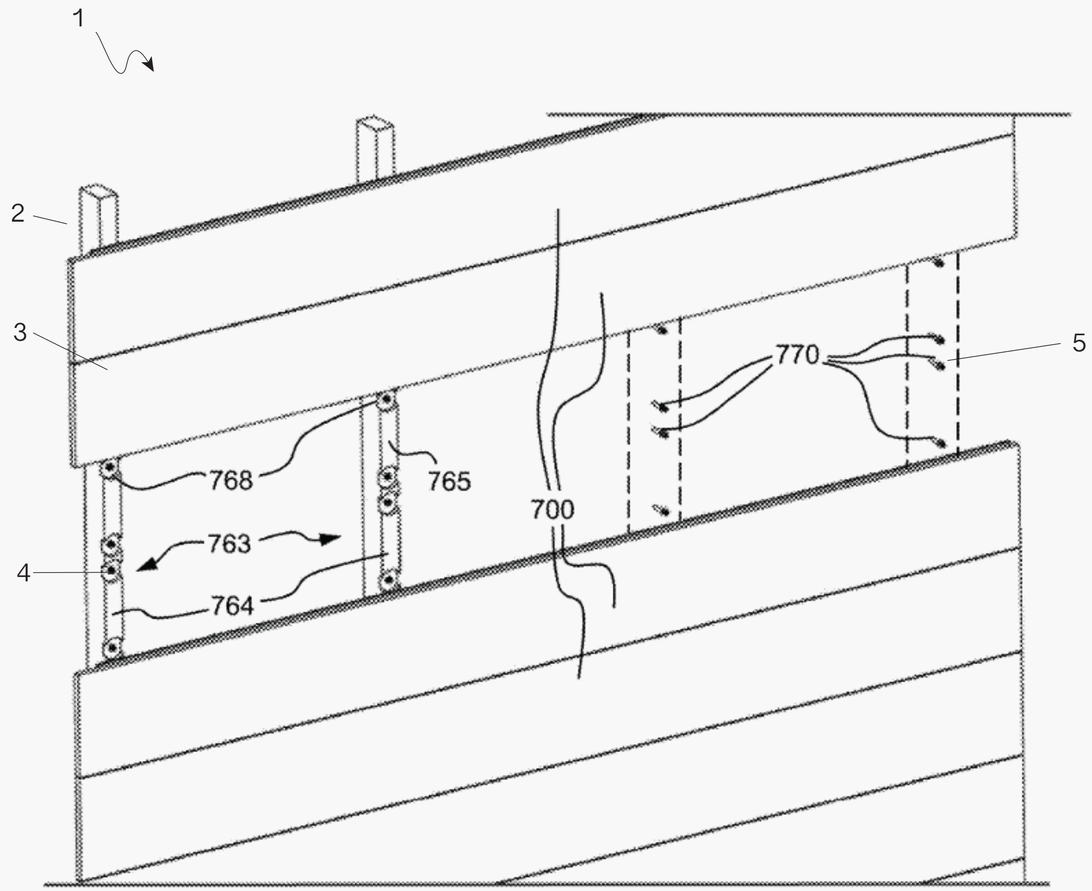
Prefab Interior Finish System Patents

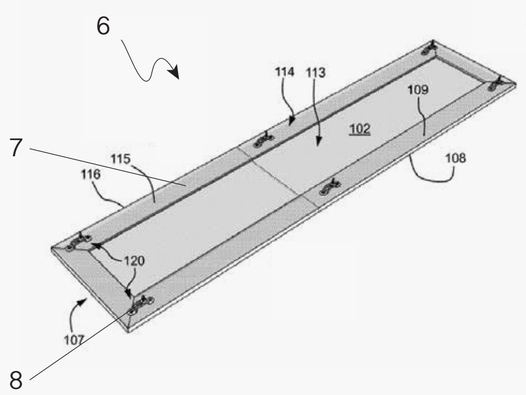
Inventor

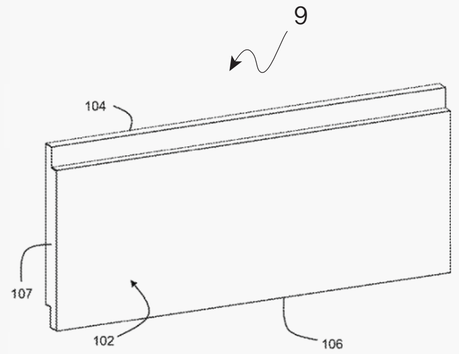
Patent Number	Title	Description
US-20220064961-A1	Building Surface Product Including Attachment Clip, Building Surface System, and Method of Manufacture	Clip attachment method for pre-finished shiplap gypsum system for faster off-site and on-site assembly.
US-11851874-B3	Interlocking Gypsum Building Surface Products, Methods of Manufacture, and Interlocking Gypsum Building Surface Systems	Pre-finished shiplapped gypsum product for faster off-time and on-site assembly.

Key

1 Prefabricated Prefinished Gypsum Wall Assembly
2 Batten
3 Prefinished Gypsum Panel
4 Routed Opening for Clip Post
5 Post Attachedment for Clip
6 Routed and Folded Prefinished Gypsum Panel
7 Routed and Folded Back Edge of Prefinished Gypsum Panel
8 Sliding Clip for Prefinished Gypsum Panel
9 Routed Shiplaped Prefinished Gypsum Panel







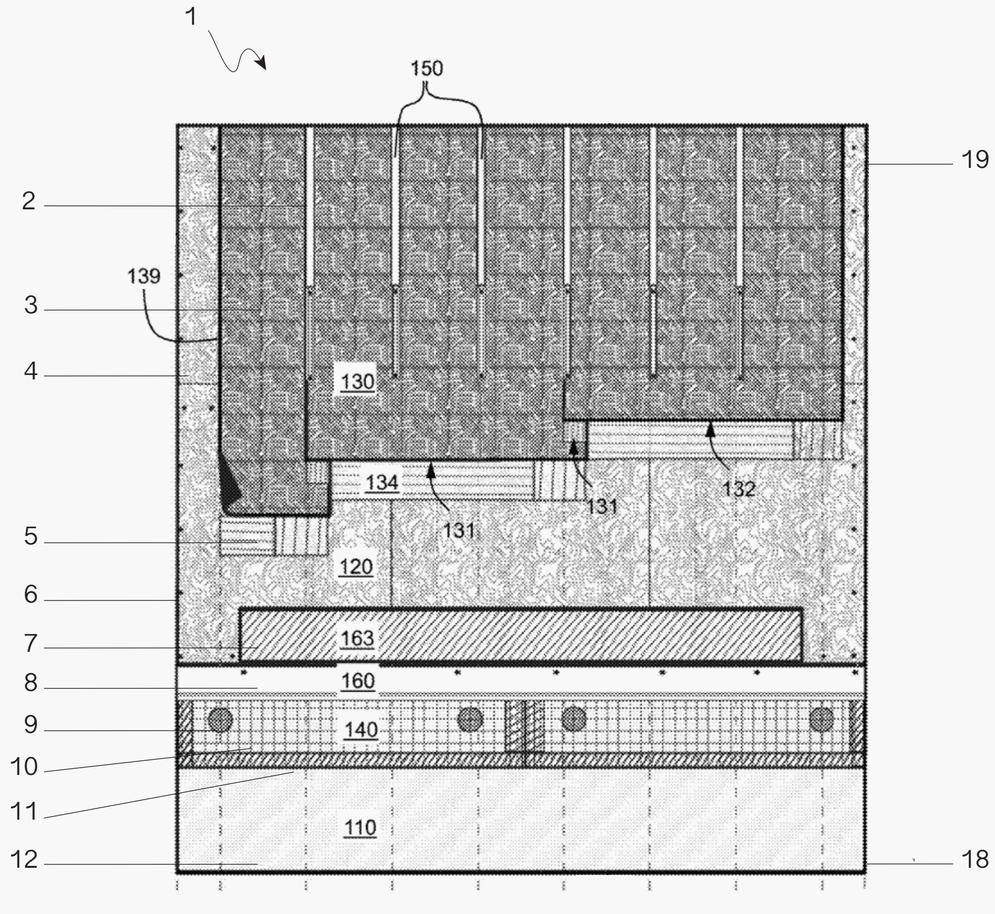
Prefab Exterior Finish System Patent

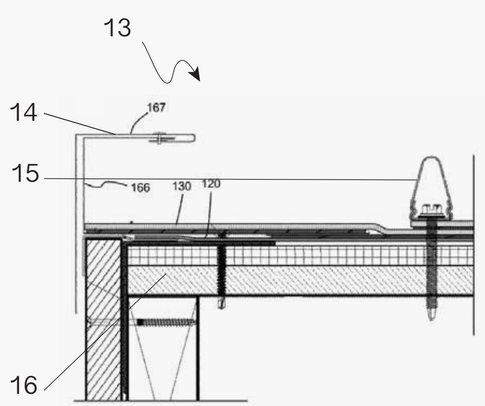
Inventor

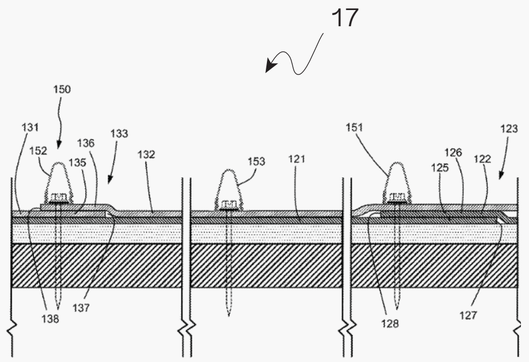
Patent Number	Title	Description
US-20220195733-A1	Rolled Roof Standing Seam System and Method of Construction	Productized prefab exterior finish resembling Metal Standing Seam for faster off-time and on-site assembly.

Key

1 Prefabricated Prefinished Rolled Roofing Assembly
2 Customized Clip-on Standing Seam
3 Rolled Roofing Capsheet
4 Glasbase Basesheet
5 Roofing Adhesive
6 Roofing Nail
7 Single Shingle Strip
8 Meta Drip Edge
9 Capped Roofing Fastener
10 Roofing Board
11 Roofing Tape
12 OSB Sheathing
13 Rake Flashing Detail for Rolled Roofing Standing Seam
14 Rake Flashing
15 Customized Clip-on Standing Seam
16 OSB Sheathing
17 Cross Section Details of Rolled Roofing Standing Seam
18 Bottom of Rolled Roofing Assembly
19 Top of Rolled Roofing Assembly







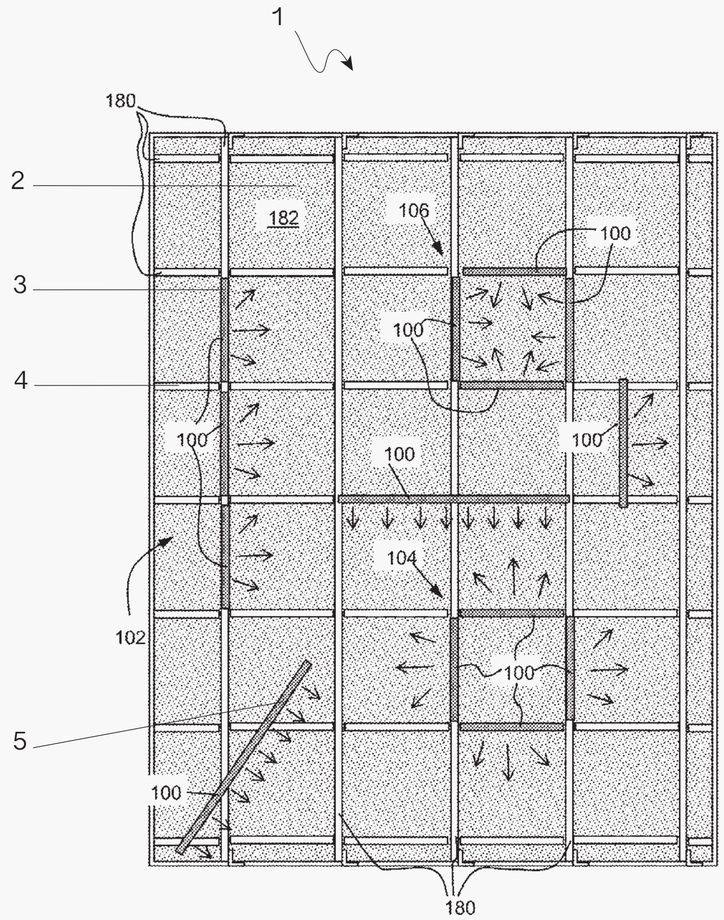
Integrated Lighting Patents

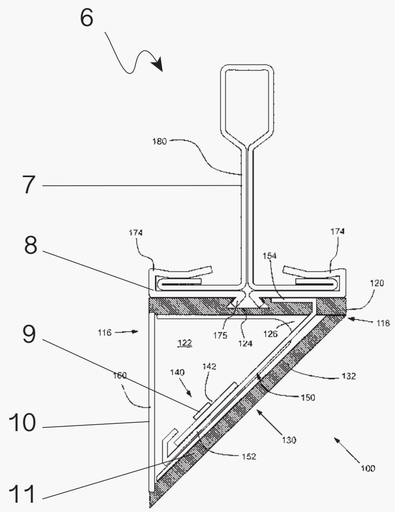
Inventor

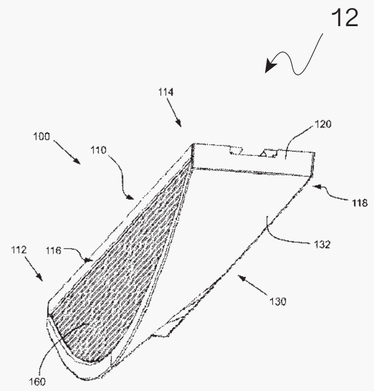
Patent Number	Title	Description
US-D898982-S	Lighting Fixture	Design patent for innovative integrated lighting system for drop ceiling systems.
US-20190309932-A1	Lighting Fixtures and Systems including them, Lighting Assembly Attachment System, and Methods of Installing Same	Uttility patent for innovative integrated lighting system for drop ceiling systems.

Key

1 Ceiling View of Drop Intergrated Lighting in Drop Ceiling
2 Standard Drop Ceiling System
3 Integrated Lighting
4 Drop Ceiling Grid
5 Integrated Lighting Installed at an Angle
6 Cross Section of Integrated Lighting Attached to Grid
7 Drop Ceiling Grid
8 Clip Attachment of Drop Ceiling Grid
9 LED
10 Glare Lens
11 Curved Case for Drop Ceiling System
12 Integrated Lighting - Perspective View







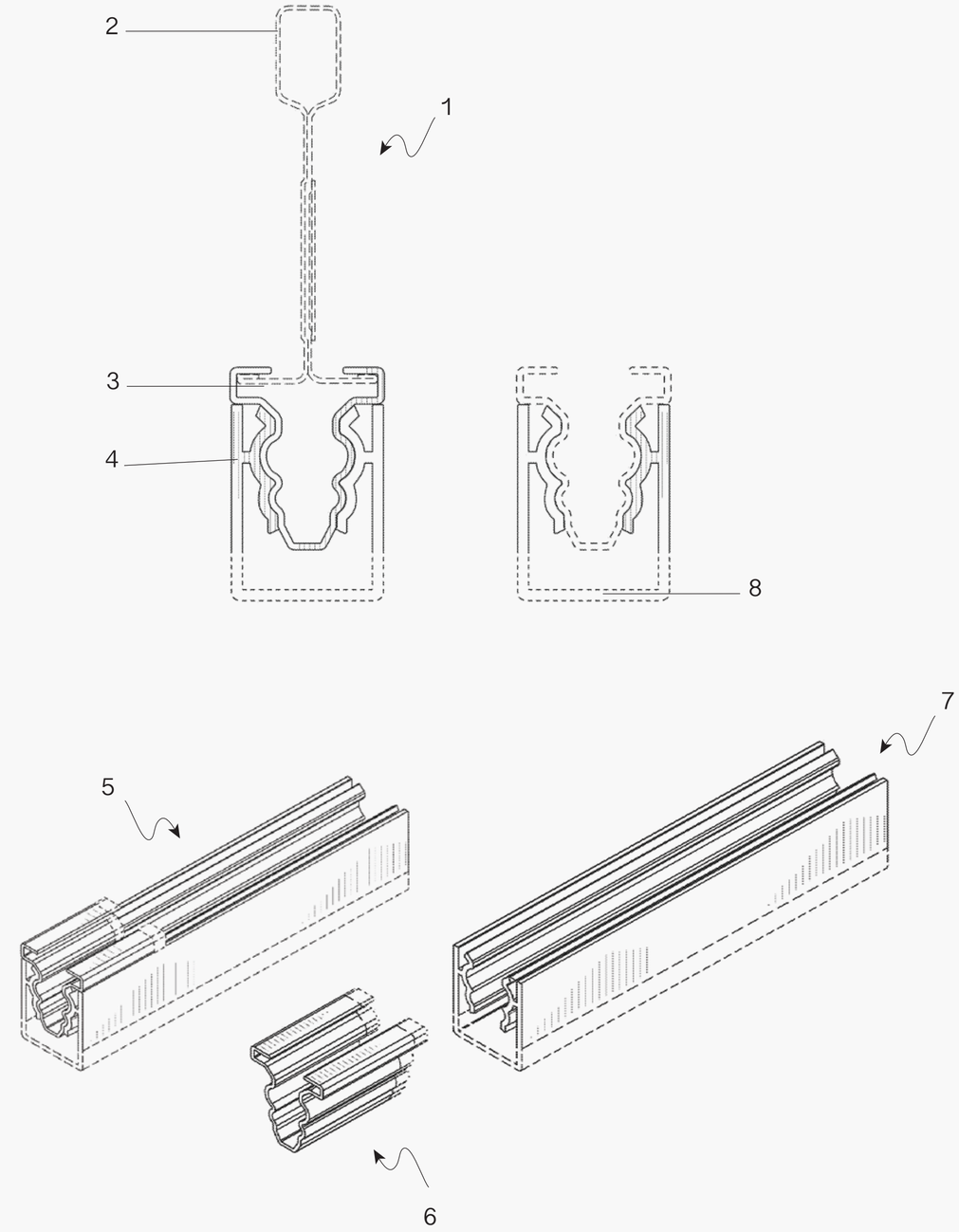
Decoratice Grid Ceiling System

Inventor

Patent Number	Title	Description
US-D873652-S	Assembly	Design patents for decorative grid ceiling system.
US-D1006608-S	Attachment Piece & Whole Clip Assembly	Ornamental design for an attachment piece and whole clip assembly for a decorative grid system.

Key

1 Decorative Grid Ceiling System
2 Standard Drop Ceiling Grid
3 Clip Attachment for Drop Ceiling Grid - Male Part
4 Decorative Pendant for Drop Ceiling Grid - Female Part
5 Attachment Clp & Decorative Pendant Assembled
6 Clip Attachment for Drop Ceiling Grid - Male Part
7 Decorative Pendant for Drop Ceiling Grid - Female Part
8 Decorative Pendants Varie in Length Options for Design Freedom



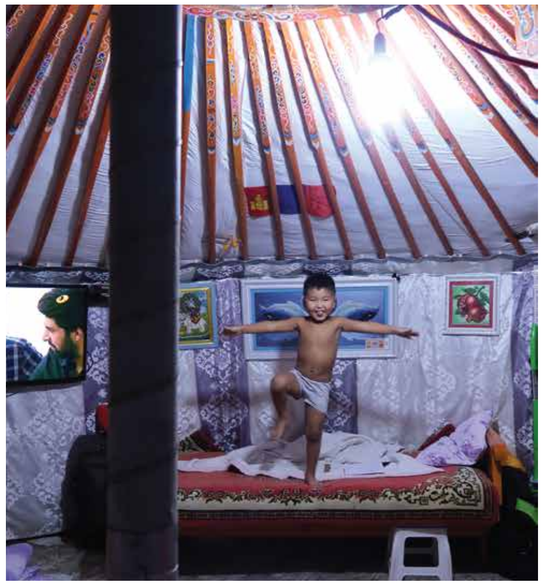
Fulbright

Research Scholar

In winter, Ulaanbaatar is the most polluted city in the world, with deadly air pollution contributing to 1 in 10 deaths in Mongolia annually. Eighty percent of the air pollution is due to families using coal burning stoves to heat their homes in the Ger Districts of Ulaanbaatar. These non-formal urban areas make up approximately two-thirds of the city's population.

In response, through my Fulbright Research Fellowship I developed an energy efficient Ger (also known in the West as a Yurt) optimized for Ulaanbaatar's low-income population to address the local air pollution crisis. In partnership with Mongolian partners, the project adapted the vernacular housing typology to incorporate the modern amenities urban families seek. The Passive Ger was a modern and sedentary adaptation of the tradtional Mongolian Ger. Using Design Thinking, the vernacular housing typology was adapted based on interviews conducted with eighteen Ger District households. The final design integrates the community members' living preferences with the architectural detailing constraints of the Passive House Standard.

Sep. 2017 - Oct. 2018, Northboro MA. USA



Tradtional Mongolian Ger Exterior and Interrior (top) Passive Ger Exterior & Interior (bottom)

From Traditional Ger to Passive Ger

The Mongolian Ger is a sacred housing typology consisting of many symbolic representations via different building components for the housing typology itself. Yet due to the housing typology's inefficient envelope design, it needed to be adapted for modern sedentary urban life while addressing the air pollution crisis. In order to effectively adapt the housing typology to meet the Passive House standard for Ulaanbaatar citizens, I lived in the Ger Areas in December's -40 winter temperatures with local familes and interviewed a total of 18 different families to gain first hand knowledge regarding local customs, living standards and aspirations. The final sculptural and contemporary Passive Ger design modern adaptation of the housing typology, and a direct result of these customer insights.

Passive Ger Specifications

Building Footprint
560 SF

Cost (including all construction costs and housing systems)
780,800 MNT per M2 (335 USD per M2)

Energy Consumption
83 kWh/M2 per year

Heating System
Combined electric stove with water heater

Thermal Resistance
R 80, highly resistant to external temperatures

Structure
Permanent structure

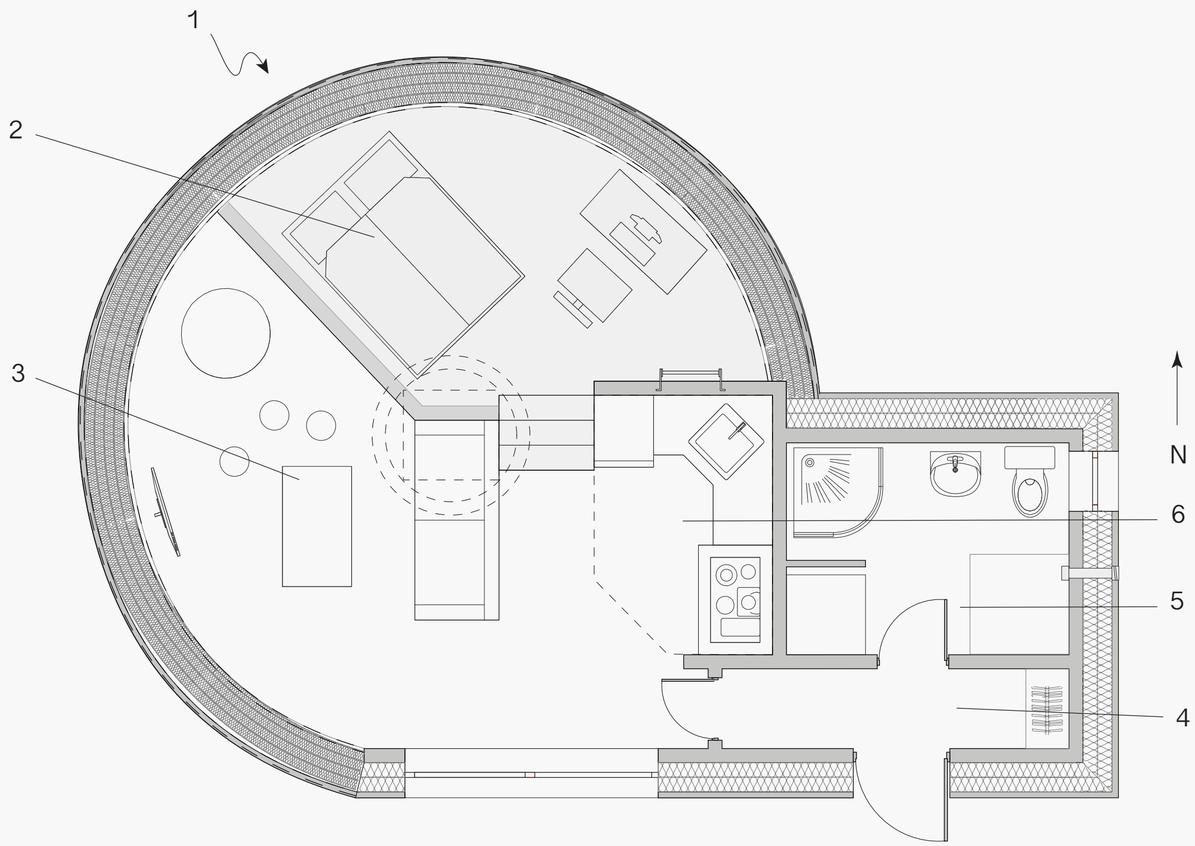
Plumbing
Certified septic and plumbing system

Window
Three triple glazing windows for passive heating & ventilation

Sleeping Layout
Living room, Bedroom, and Loft space above the Kitchen

Key

1 Passive Ger Floor Plan
2 Bedroom // untlagyn öröö
3 Living Room // zochny öröö
4 Entrance // orokh
5 Bathroom // ugaalgyn öröö
6 Kitchen // gal togoony



Passive Ger Interior Photographed from the Loft

The Modern Mongolian

The modern and sculptural interior of the Passive Ger provided families in the Ger Area with the comforts they sought while preserving the intimate and familial atmosphere of traditional Mongolian home life. Over time, the final design earned widespread respect and admiration among locals.

Passive Ger Building Technology

Inventor

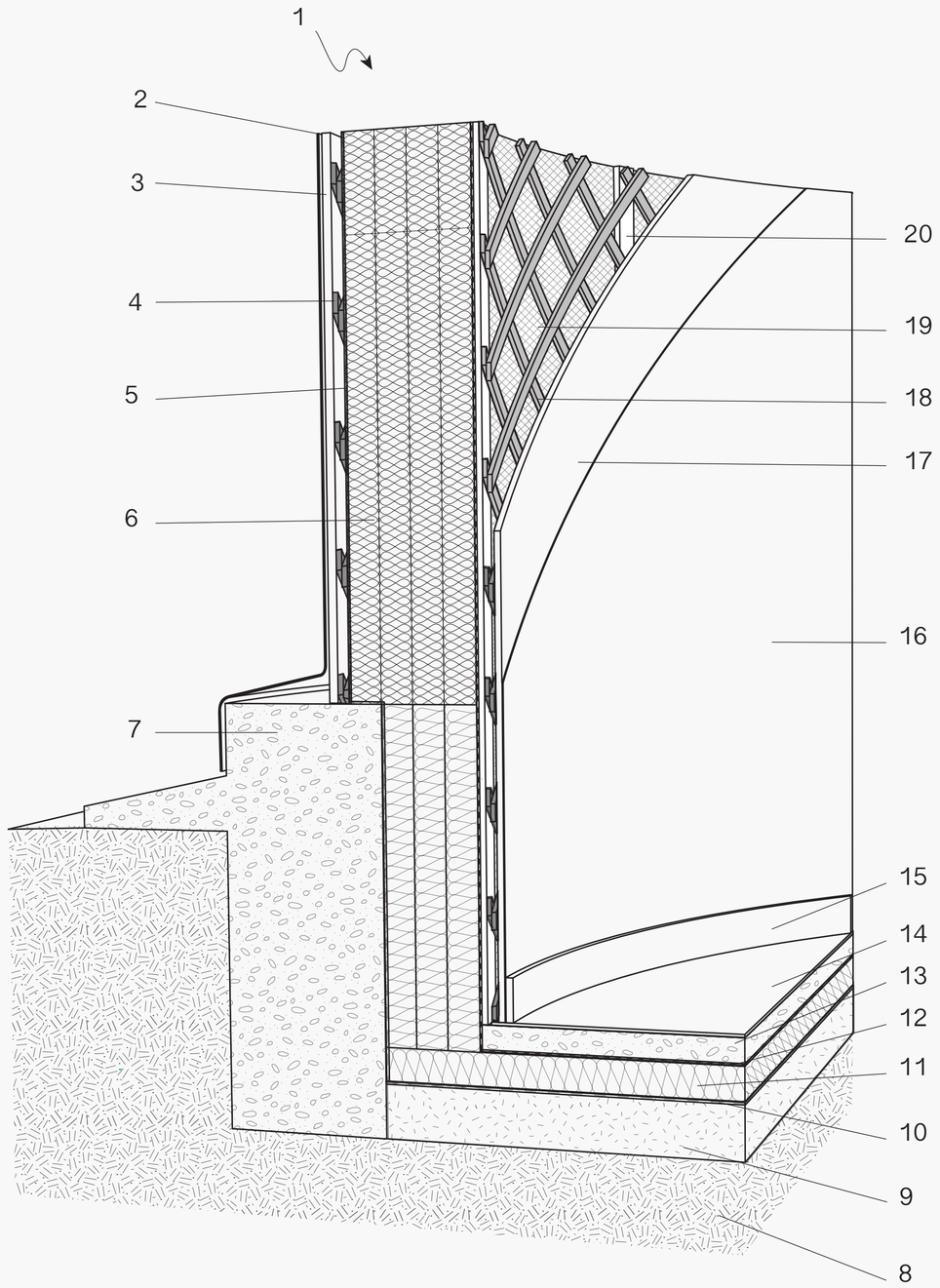
Description

The Passive Ger was a hybrid of traditional a Tradtional Mongolian Ger and contemporary building materials to meet the Passive House Standard. The new design replaced traditional insulation materials such as Mongolian felt with Mongol Basalt Rockwool insulation to provide substantial thermal mass and better retain heat in the winter. While the the traditional Khana (lattice wall) and Uni (crossbracing) were preserved and utilized for their symbolic and structural role.

These traditional Ger components were also used on the exterior of envelope between the air barrier and PVC membrane to allow for airflow and prevent moisture condensation. As a resutl, the final building envelope system allowed for no thermal bridging or moisture condensation, crearting a longer lasting sedentary structure with an improved energy performance that was 8 times more energy efficient than a traditional Mongolian Ger.

Key

1 Passive Ger Building Envelope
2 PVC Membrane
3 Batten
4 Khana (lattice walls)
5 Air Barrier Membrane
6 Rockwool Insulation
7 Concrete
8 Soil
9 Crushed Stone / Washed Gravel
10 Air Barrier Membrane
11 EPS
12 Vapor Barrier Membrane
13 Concrete
14 Vinyl Floor
15 Baseboard
16 Wallpaper
17 Gypsum
18 Khana (lattice walls)
19 Vapor Barrier Membrane
20 Batten



Systems for Scaling

The Passive Ger project was a grassroots initiative featuring a scalable housing solution. This innovative housing typology was meticulously designed to establish a sustainable value chain and construction ecosystem, empowering local partners to independently replicate the building technology. Consequently, I was able to effectively build a Passive Ger prototype in addition to securing investment for the final design by a local investor who sought to build an additional 13 units.

Photograph of Core Passive Ger Team including the local communicty leader, the Passive Ger customer, myself, and the final Investor.

Solar Decathlon

Student Team Leader

The Solar Decathlon is a collegiate competition established by the U.S. Department of Energy challenging university students to design and build highly efficient and innovative buildings powered by renewable energy.

In response, Techstyle Haus competed in the 2014 Solar Decathlon Europe competition, creating the world's first prefabricated Passive textile home that was publically displayed in the gardens of Versailles France. The interdisciplinary team of Brown University, the Rhode Island School of Design, and Erfurt University of Applied Sciences created an innovative and pragmatic solution that was built in response to standardized and poorly constructed buildings which imbued rural and suburban environments in the US and France. In addition to leading project management efforts as the team lead, I was responsible for developing the core Passive House textile building technology in addition to the Rural Urban Aggregation scheme for our end customer in Lessac France, The Domaine de Boisbuchet.

Sep. 2011 - Aug. 2014, Providence RI. USA & Versailles France

A New Spin on Sustainablity

Techstyle Haus pioneered an novel building technology tailored to harness the extraordinary properties of high-performance textiles, advanced materials, and cutting-edge building science practices. The state-of-the-art housing solution established a new benchmark for Passive House and bio-mimetic design. The sustainble design leveraged additional efficiencies through the strategic utilization of lightweight materials to facilitate a more expedient 10-day on-site prefab construction process.

Techstyle Hause Building Technology

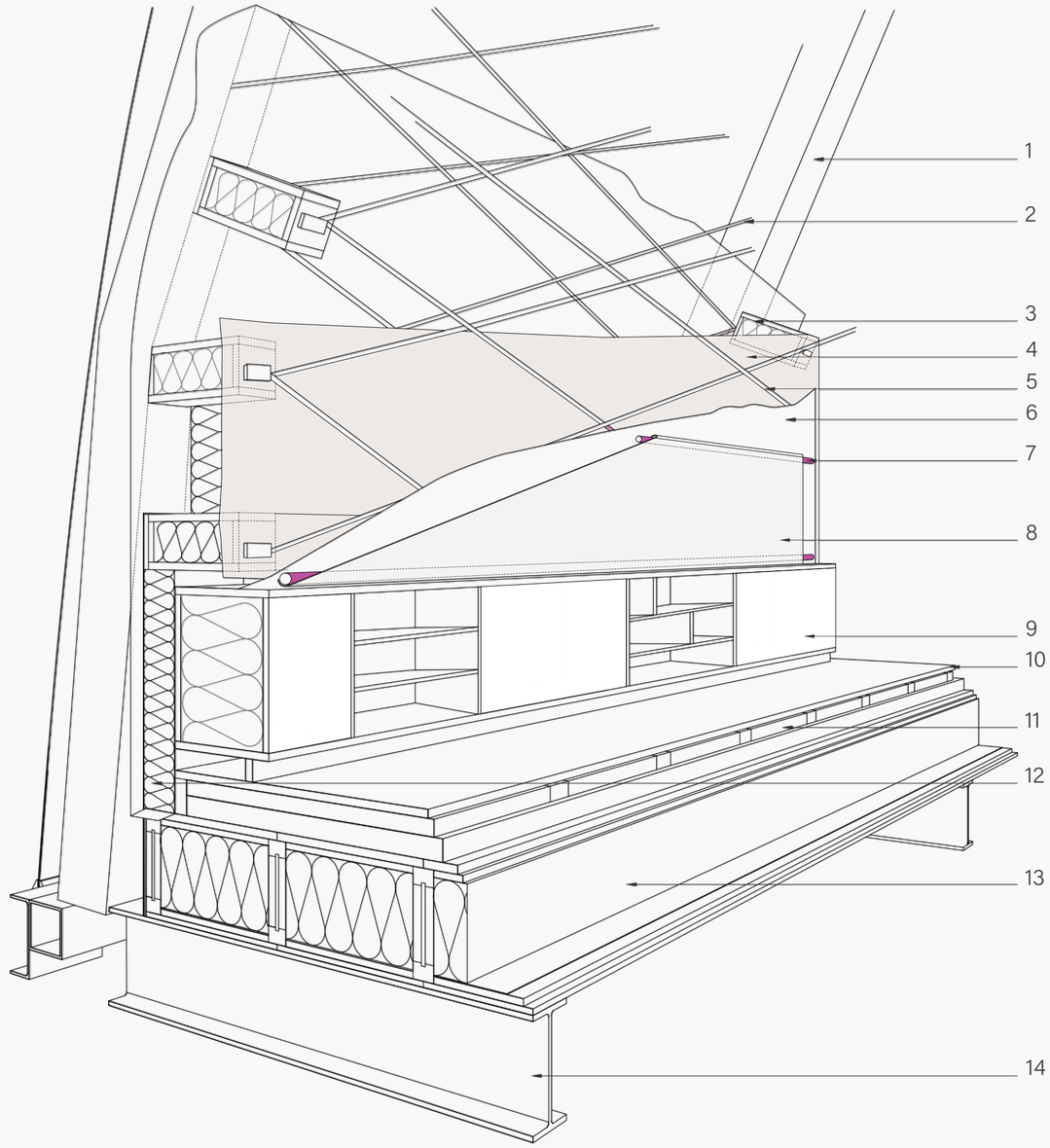
Inventor

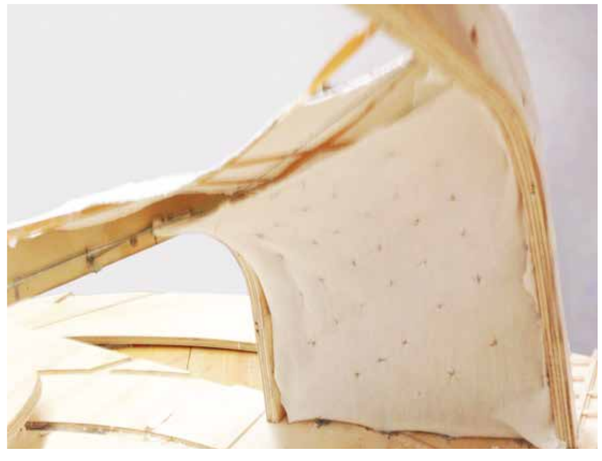
Description

Flexible prefabricated insulated building envelope system leveraged advanced functional fabrics and innnovative construction methods to meet the Passive House Standard. The highly engineered building envelope was optimized for maximum performance, while offer a more robust enclosure design for extreme climates - including a category 4 hurricaine resistant building envelope with a fire rated interior and exterior high-performing textiles.

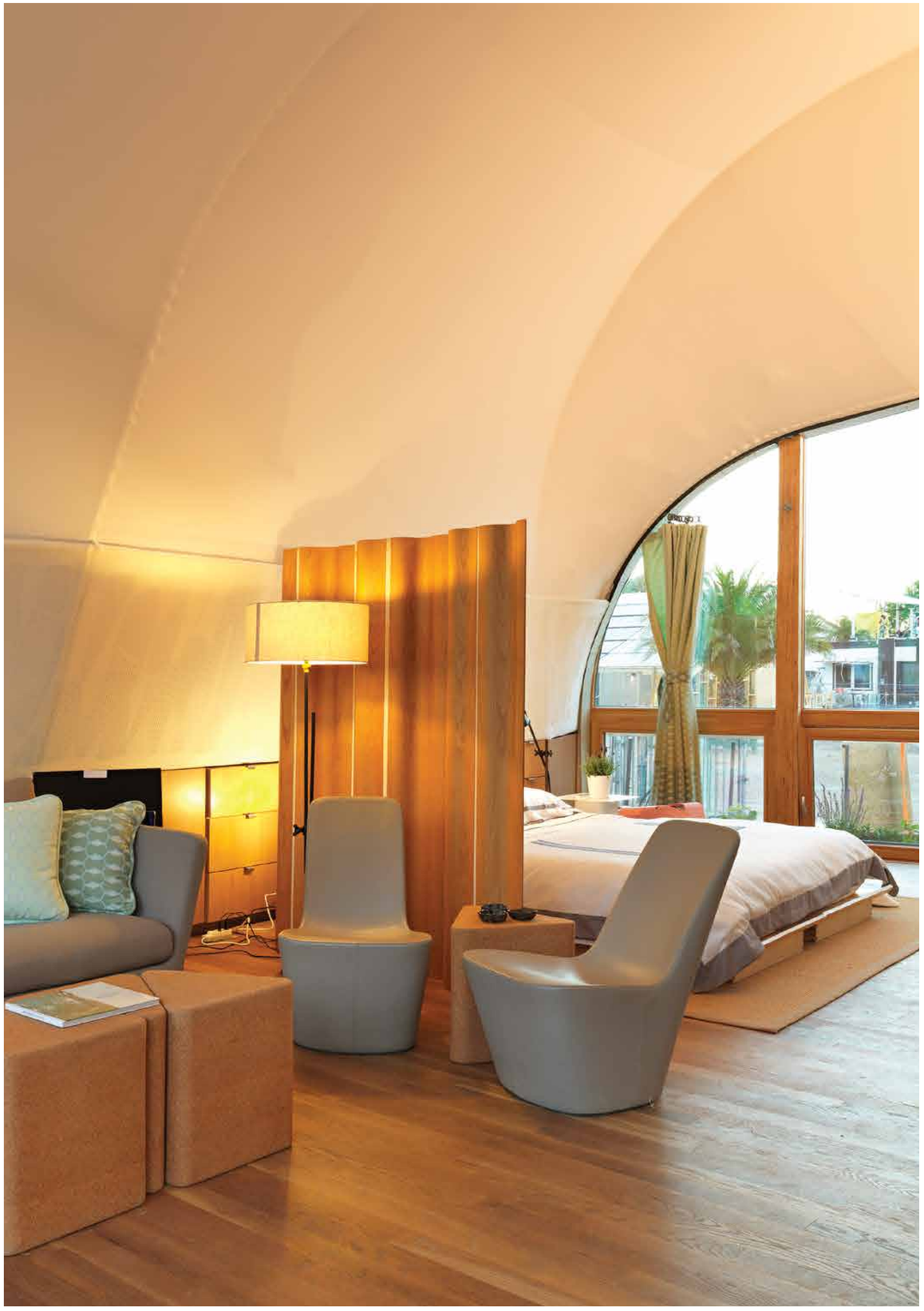
Key

1 Steel Rib
2 Exterior Rachet Strapping
3 Insulated Wood Blocks
4 Isover Vario Barrier
5 Interior Ratchet Strapping
6 Interior Lightblock Fabric
7 Aluminium Transformit Framing
8 Interior Stoll Knit Fabric
9 Insulated Built-Ins
10 Finished Hardwood Flooring
11 Insulated Subfloor
12 Mineral Wool Insulation
13 Structural Floor Pallet
14 Steel Frame





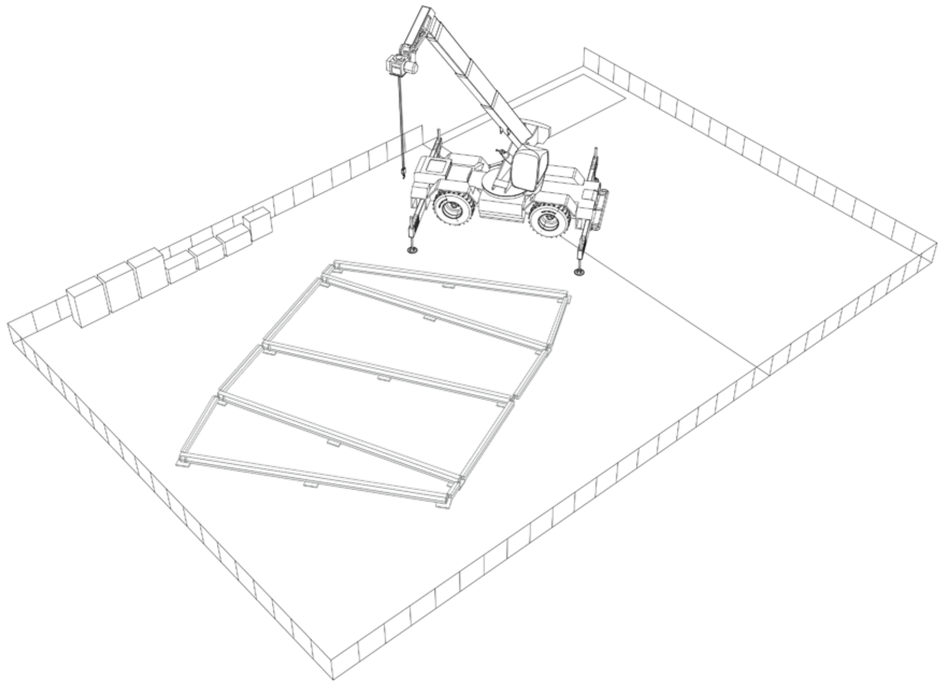
Iterative prortotyping for textile passive house building technology



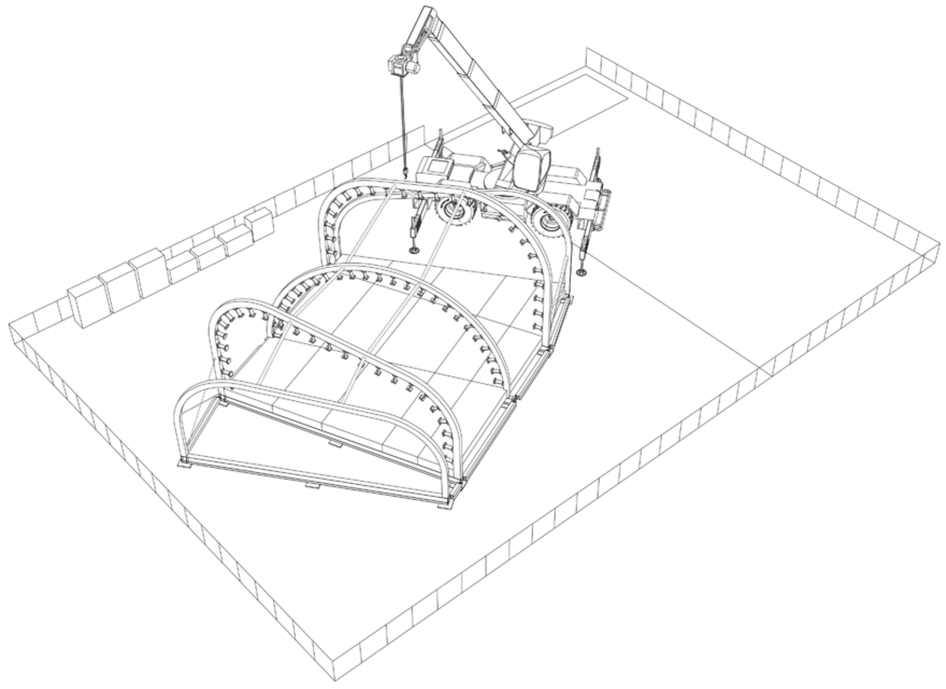
Interior Photographs of Techstyle Haus aat the Solar Decathlon

Construction Sequence for the 10 Day Build

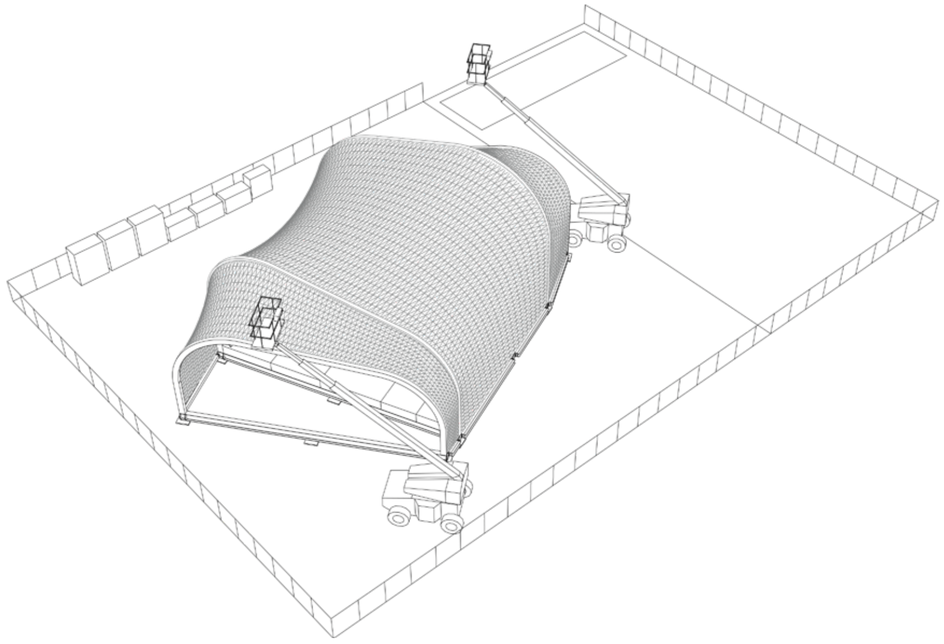
1 Site Preperation, Footings & Steel Frame Erection



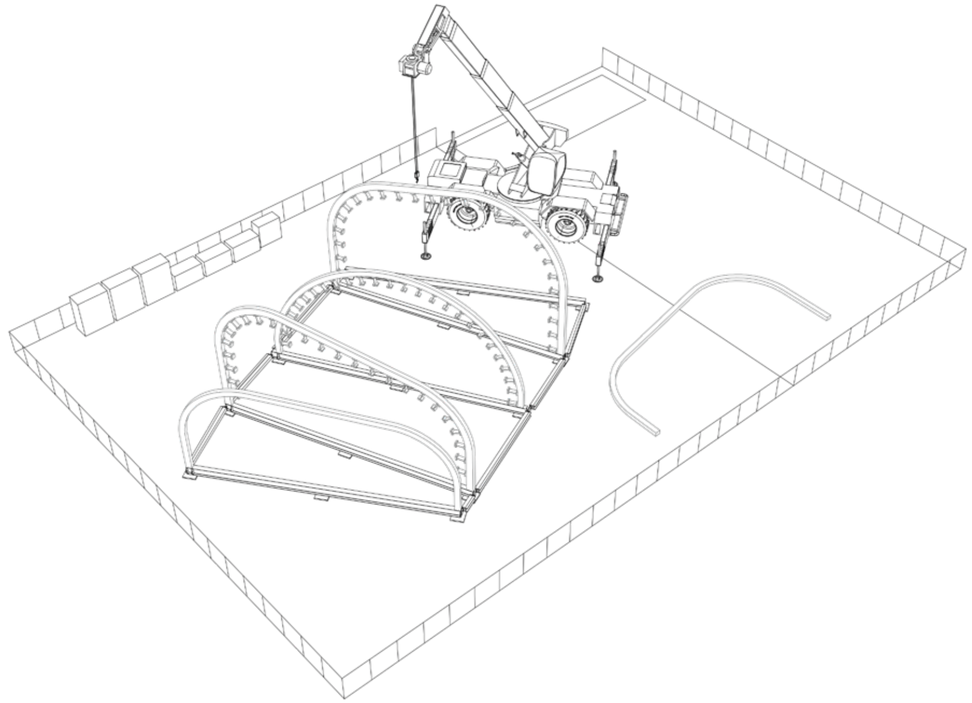
2 Installation of Struts and Cross Bracing



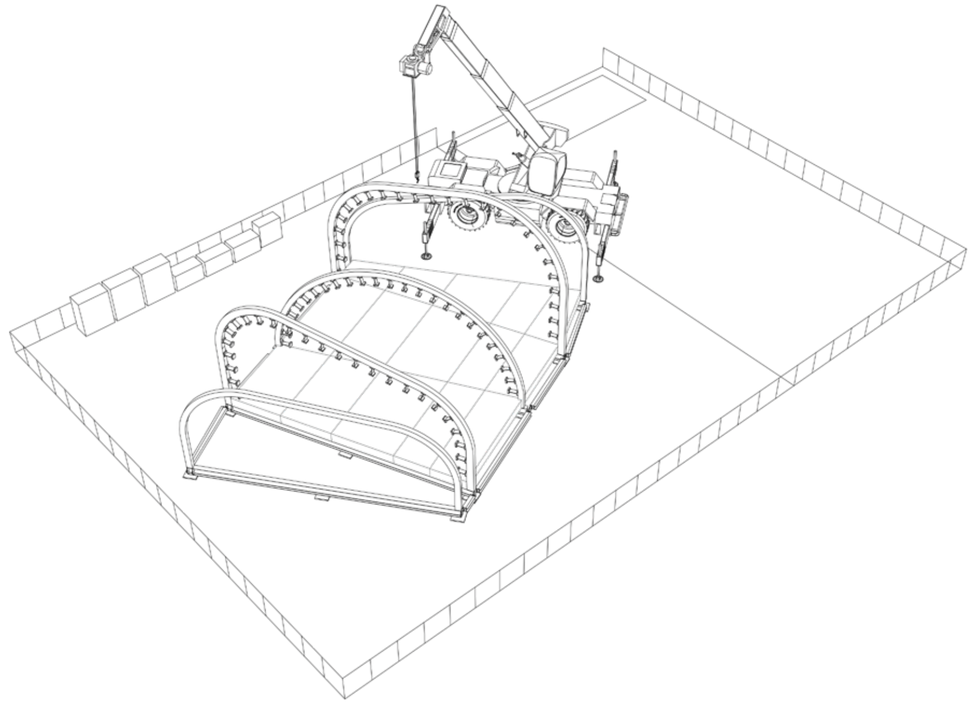
3 Sheerfill Membrane Installation



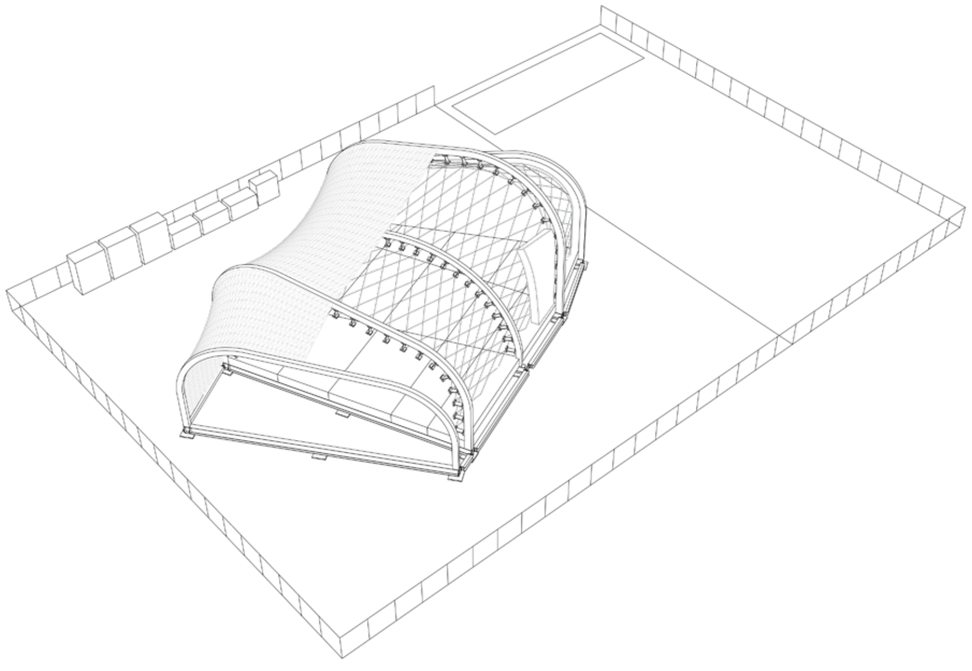
4 Steel Rib Erection



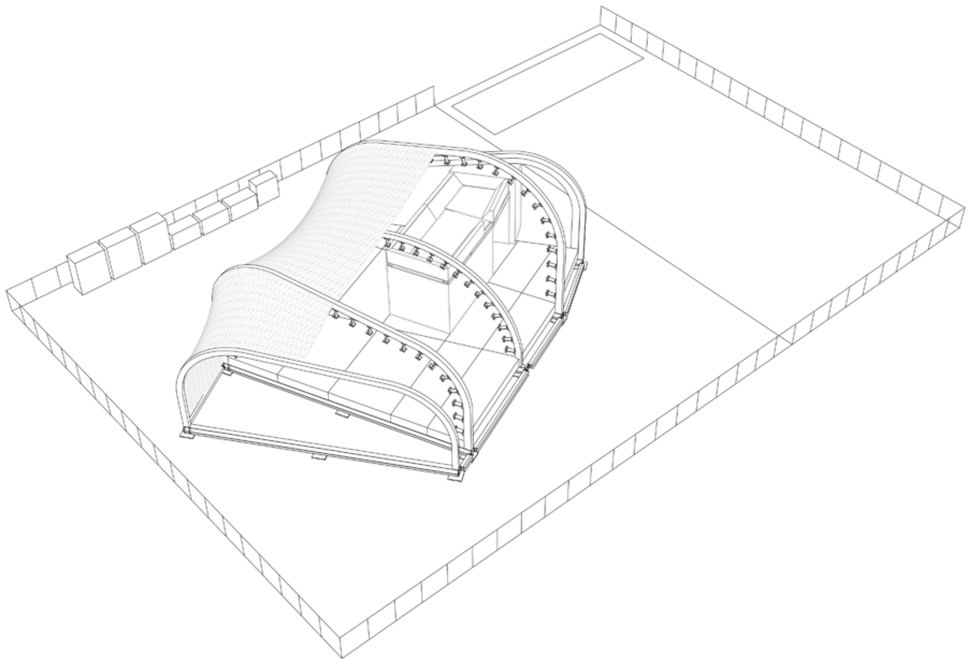
5 Floor Pallet Installation



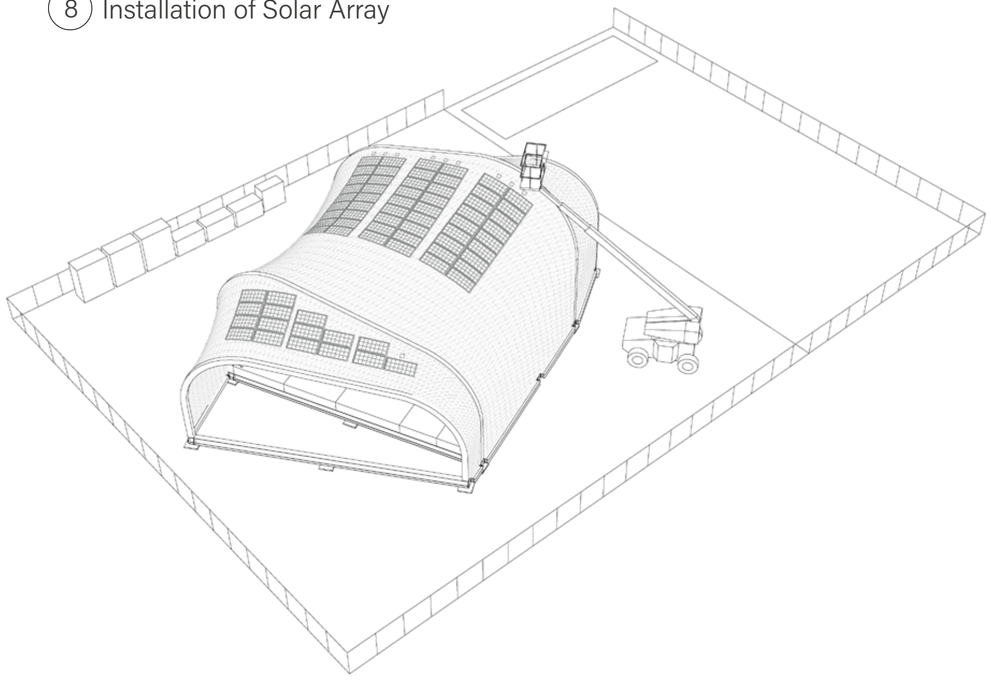
6 Installation of Strapping and Insulation



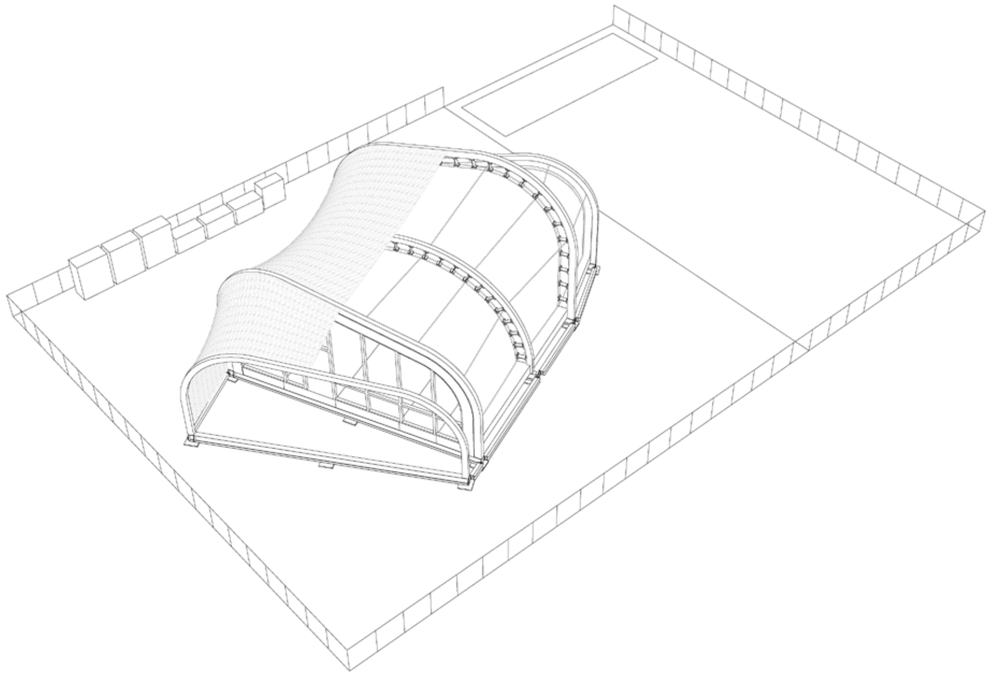
7 Core Installation



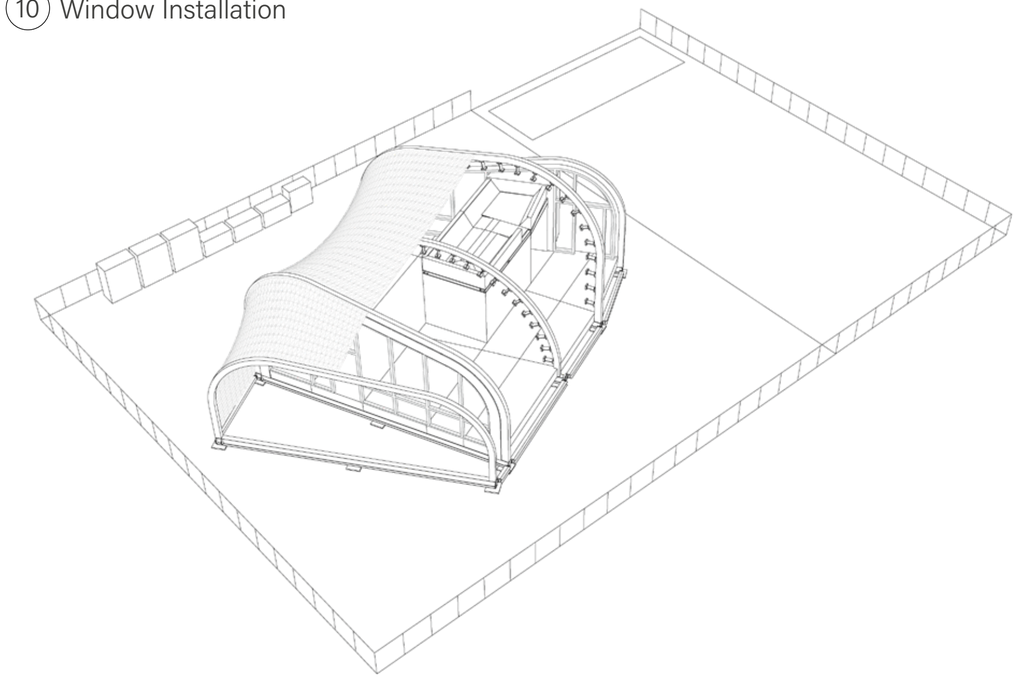
8 Installation of Solar Array



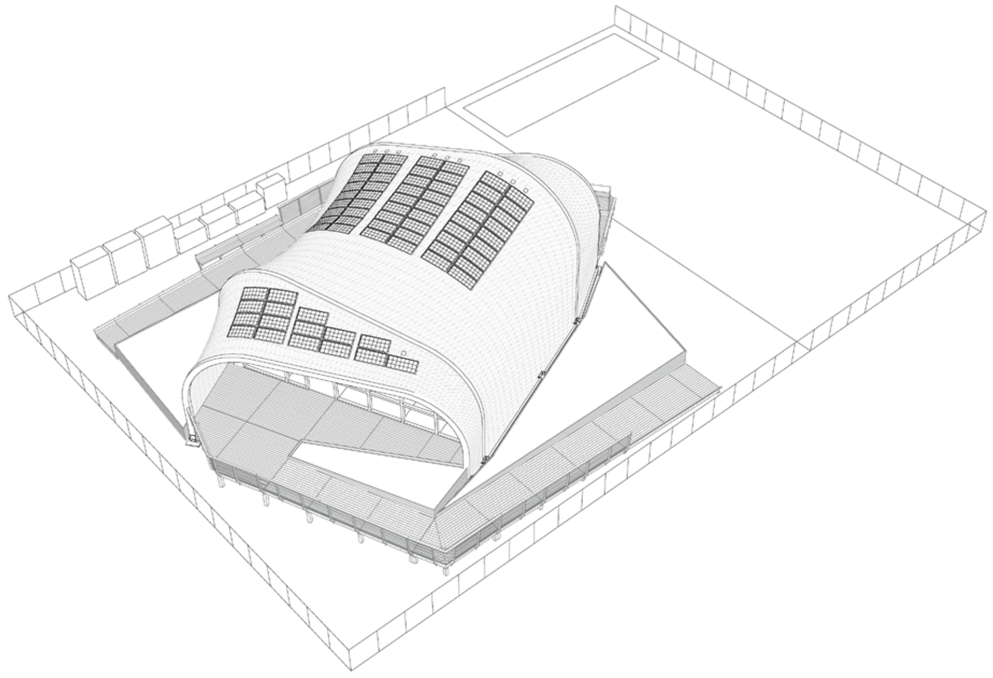
9 Intallation of Interior Fabric



10 Window Installation

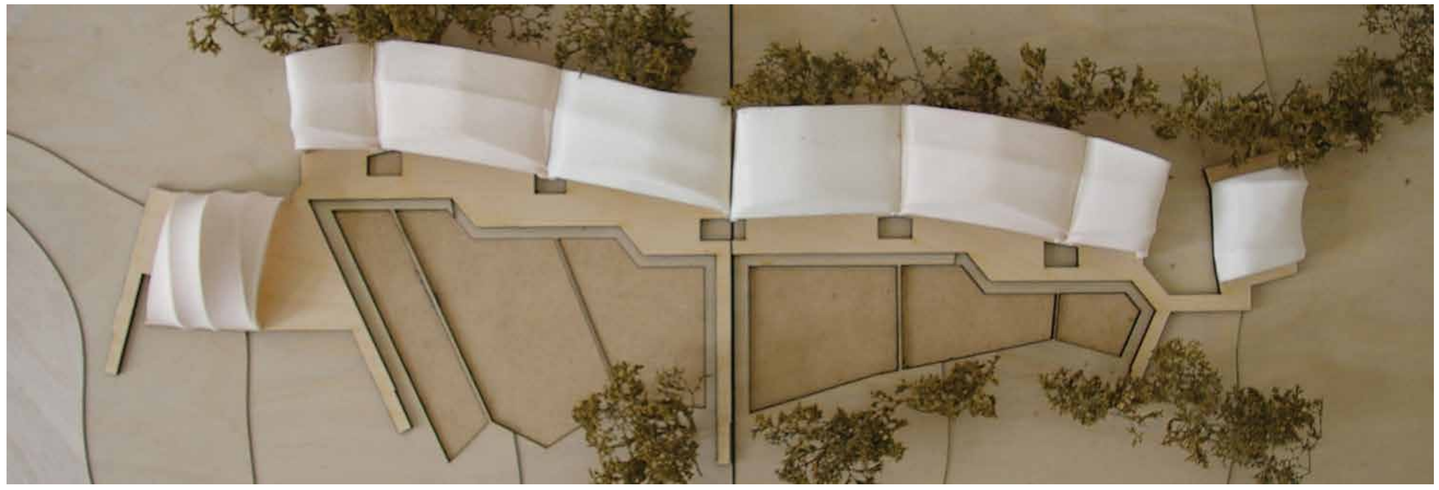


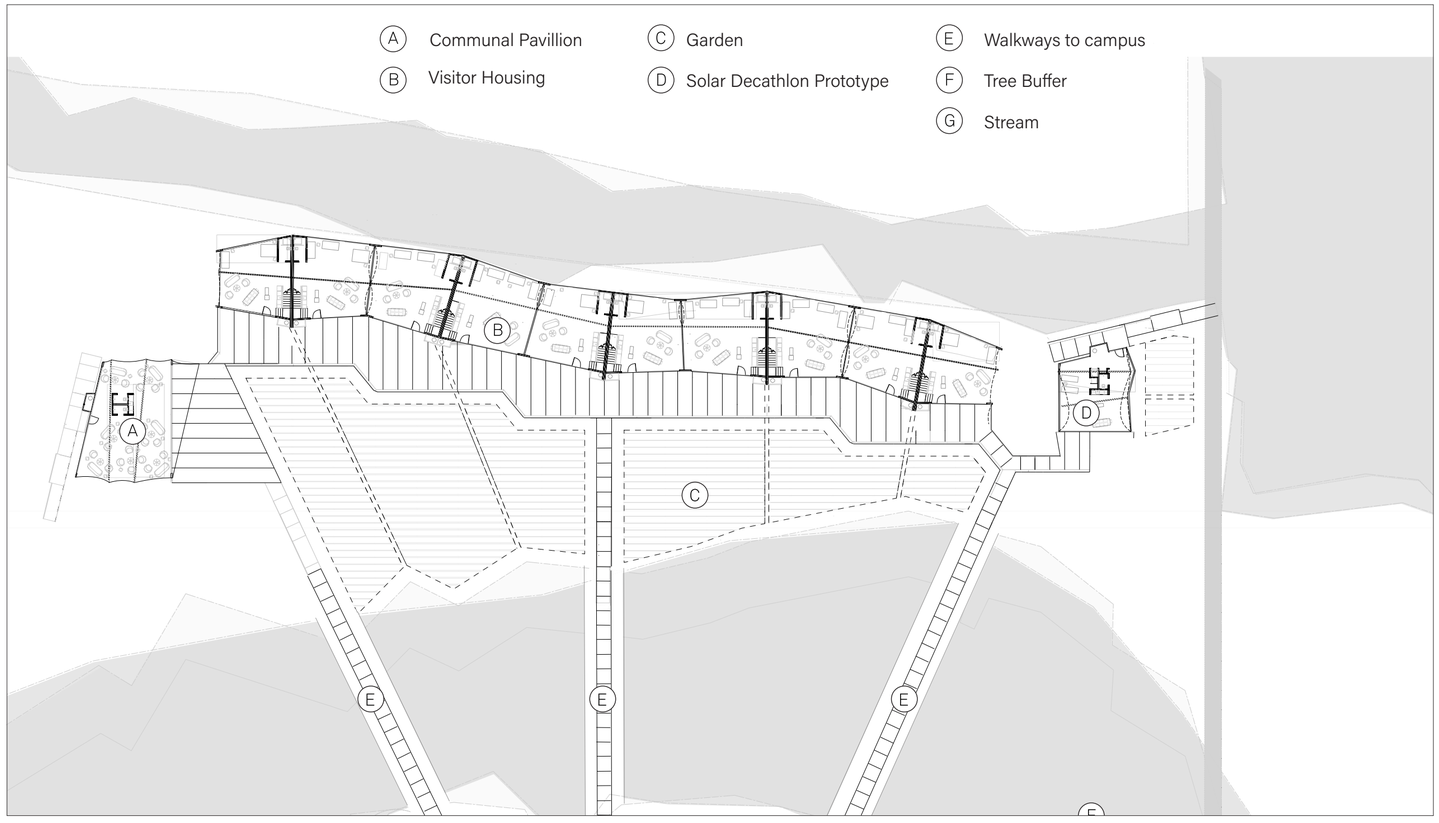
11 Installation of Decks and Planters



Biomimetic Design

Techstyle Haus's sophisticated biomimetic design was meticulously crafted for remote applications. Nestled in the scenic rural landscape of the South of France, its organic envelope was tailor-made to seamlessly integrate a high-performing flexible photovoltaic system to efficiently meet the household's electrical demands.





Rural Urban Aggregation

Le Domaine de Boisbuchet, is a cultural center for the arts and design in Lessac France. Founded by Alexander von Vegesack (previously the curator of the Centre Pompidou and Vitra furniture) the institution is dedicated to the interdisciplinary development of critical thinking through art and design. Techstyle Haus focused on developing a sustainable rural-urban system, to mitigate the per capita energy consumption of France's rural landscape. The long-term goal for the Domaine de Boisbuchet is to aggregate the Techstyle building technology and deploy a multi-family housing system - creating 10 visitor housing units and one communal Pavilion using the Techstyle assembly.