HINGE HOUSE

SUBMISSION FOR:
PRE-APPROVED PLANS FOR
DETACHED ACCESSORY DWELLING UNIT

City of Seattle

FRASER + FOGLE
architects

701 N 36TH STREET
SUITE 330
SEATTLE, WA
425-455-3436

PLAN PRICE: $1000
HOURLY RATE: $100/HR

PROJECT DESCRIPTION

Fraser + Fogle Architects began designing HINGE HOUSE with a goal to make a home adaptable to numerous lot types in Seattle while minimizing the risk of a detached accessory dwelling unit (DADU) exceeding the City's lot coverage limits. Using the regions with the highest rate of respondents as published in the Design Criteria Survey Results, we surveyed the City's zoning maps for residential lot sizes and found that the most common of these ranged from 50 to 60 feet wide and 100 to 120 feet deep. Based on this data, we produced a modular system that could be located on the smallest of these lots with minimal impact to lot coverage, allowing for broad applicability within the predominant SF 5000 residential zone and expansion into the SF 7200 and SF 9600 zones.

NARRATIVE

HINGE HOUSE is a 330 gross (270 net) square foot modular DADU system with a base model comprising two modified shipping containers treated as interdependent single-story modules. The live/work module includes ample storage and prioritizes multitasking furniture that rolls, folds, and slides to accomplish the varied requirements of daily life. The utility module contains most of the functional systems and plumbing elements, including a rainwater reclamation system and storage for energy produced by optional solar panels.

HINGE HOUSE is customizable and made-to-order, with shop-fabricated modules transported for on-site installation and expansion. We leverage the design intelligence inherent to shipping containers and depart from their industrial character by providing home owners with material options rooted in Pacific Northwest modernism. That local sensibility extends into environmental impact: strategically-placed windows invite cooling cross-ventilation, and a green roof grows under the high summer sun and allows lower winter light indoors.

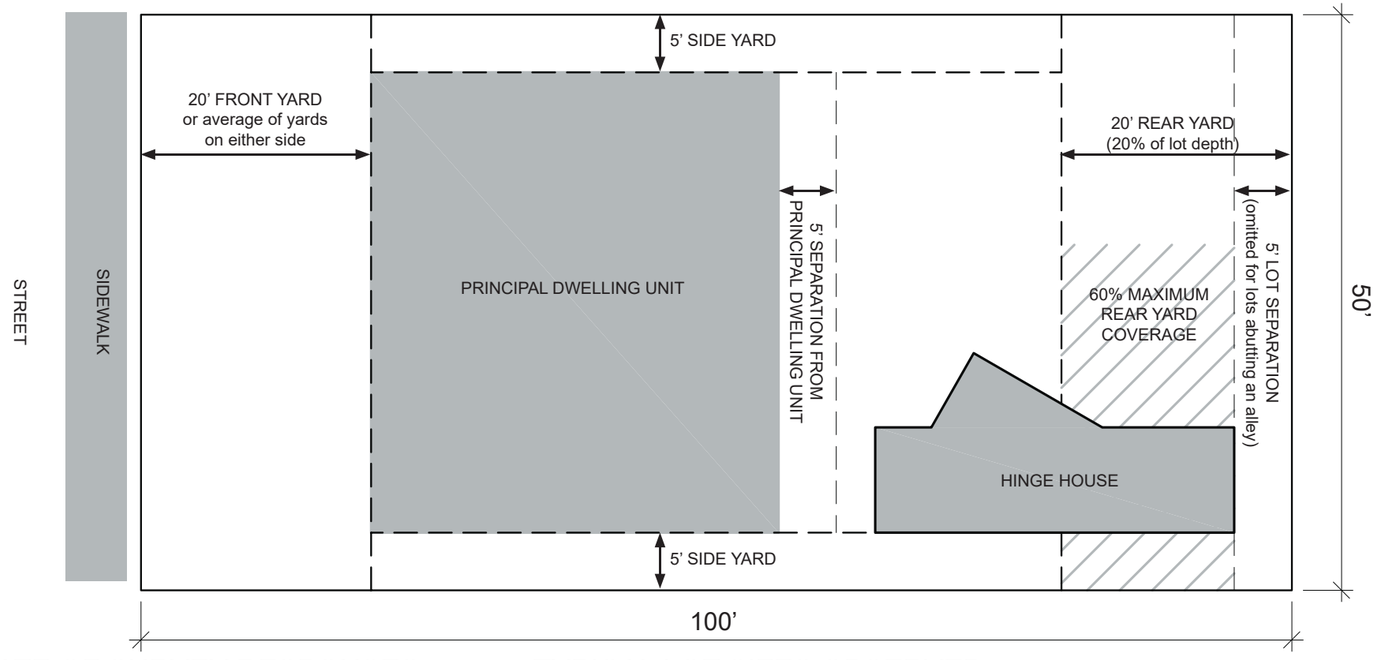
HINGE HOUSE was designed with the intent of creating a visitable space, incorporating elements of universal design to accommodate people of varying ages and abilities with its single-story open floor plan. A connection to the principal dwelling unit can be emphasized to foster community or understated to maximize privacy based on the home owner's preference. The base module may be oriented about either axis to accommodate different lot configurations and maximize the efficacy of passive energy systems already designed into HINGE HOUSE. This approach produces a compact DADU constructed from an upcycled frame that balances cost, performance, and quality.

Welcome to HINGE HOUSE.

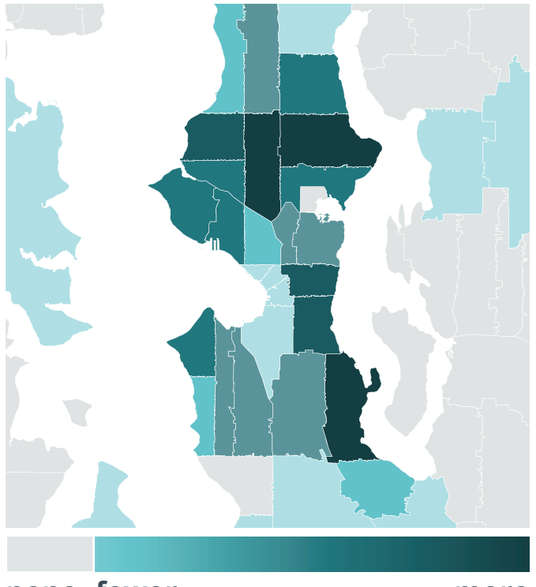
COST ESTIMATE

$90,750 - $123,750
transportation, installation and site work not included

LOT COVERAGE DIAGRAM

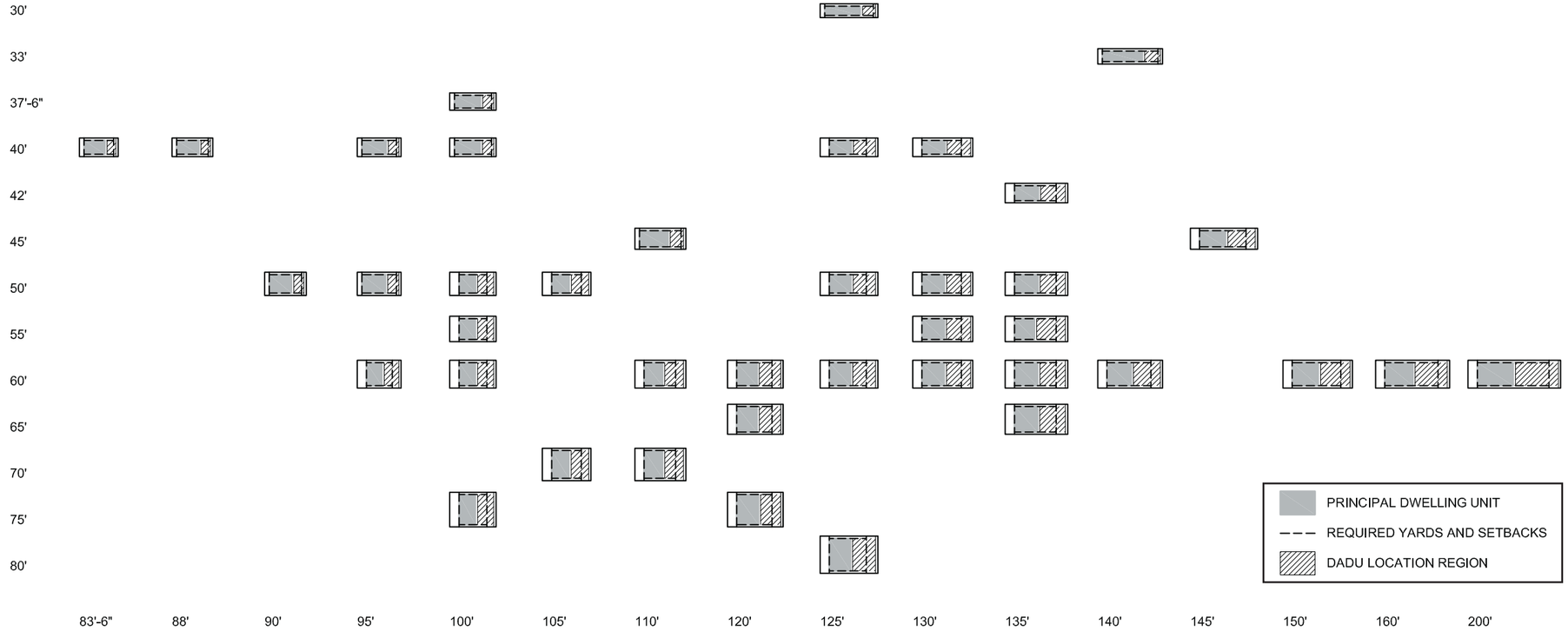


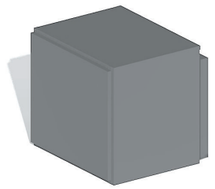
RATE OF SURVEY RESPONSES



source: *Pre-approved Plans for Accessory Dwelling Units Survey Results*, published by the City of Seattle, November 2019.

TYPICAL LOT SIZES OBSERVED





UTILITY MODULE
8’ W x 10’ L x 9-1/2’ H

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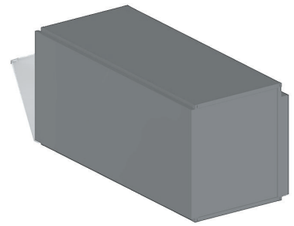
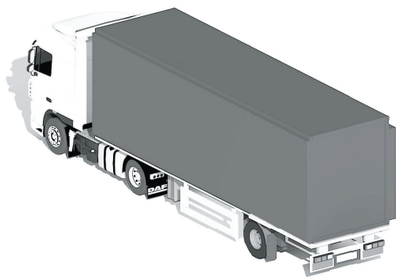
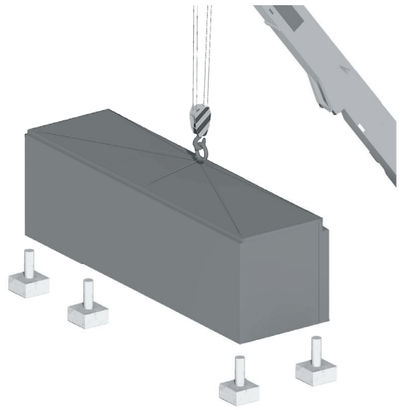


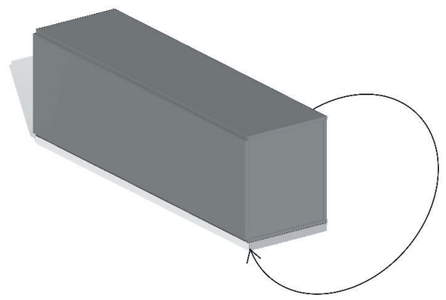
LIVE/WORK MODULE
8’ W x 20’ L x 9-1/2’ H



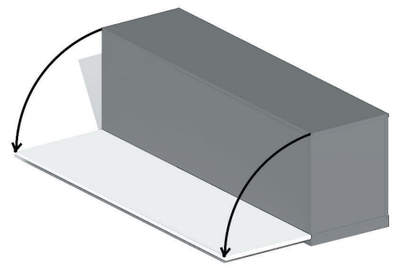
1. TRANSPORTATION



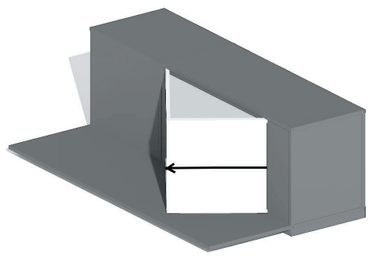
2. INSTALLATION



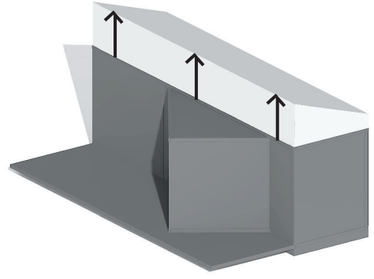
3. UNFOLD FLOOR



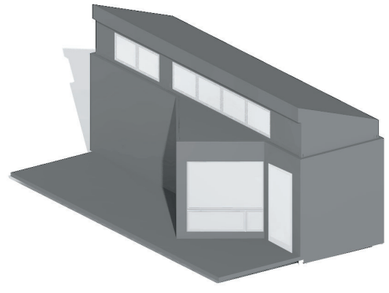
4. UNFOLD DECK



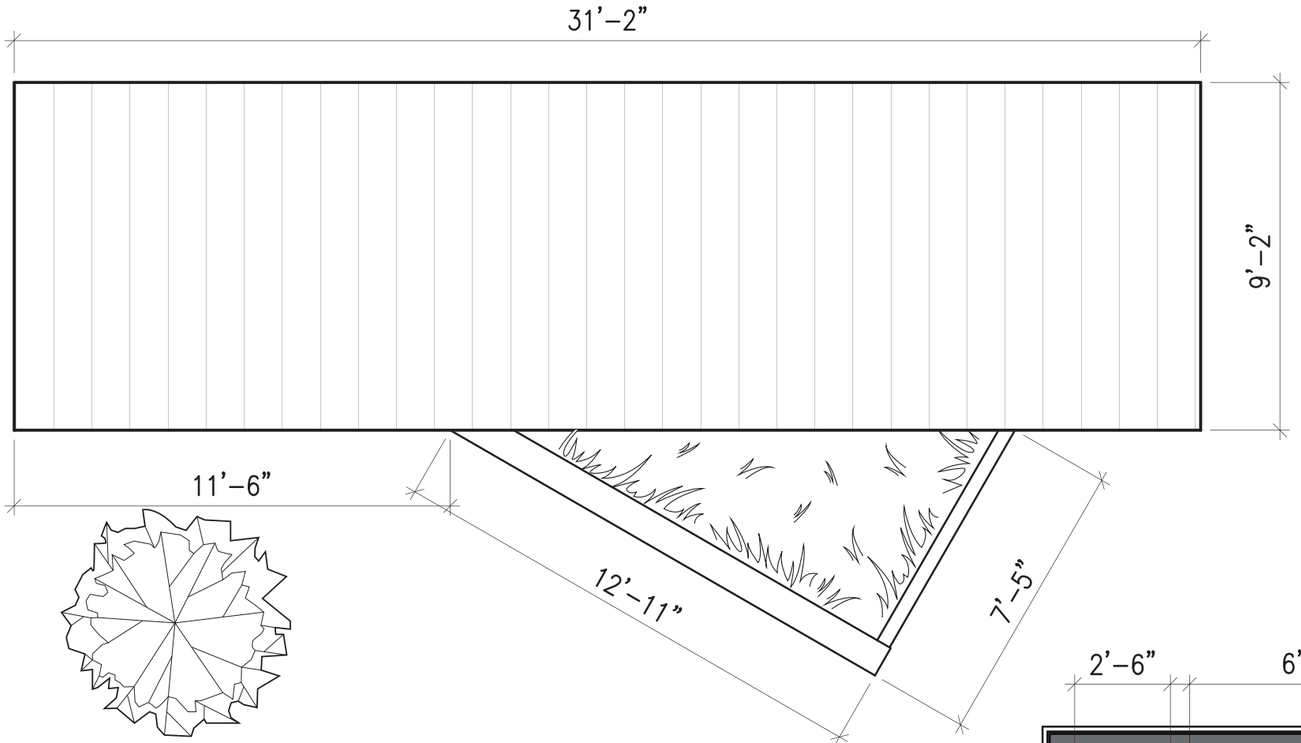
5. HORIZONTAL EXPANSION



6. VERTICAL EXPANSION



7. FINAL CONFIGURATION



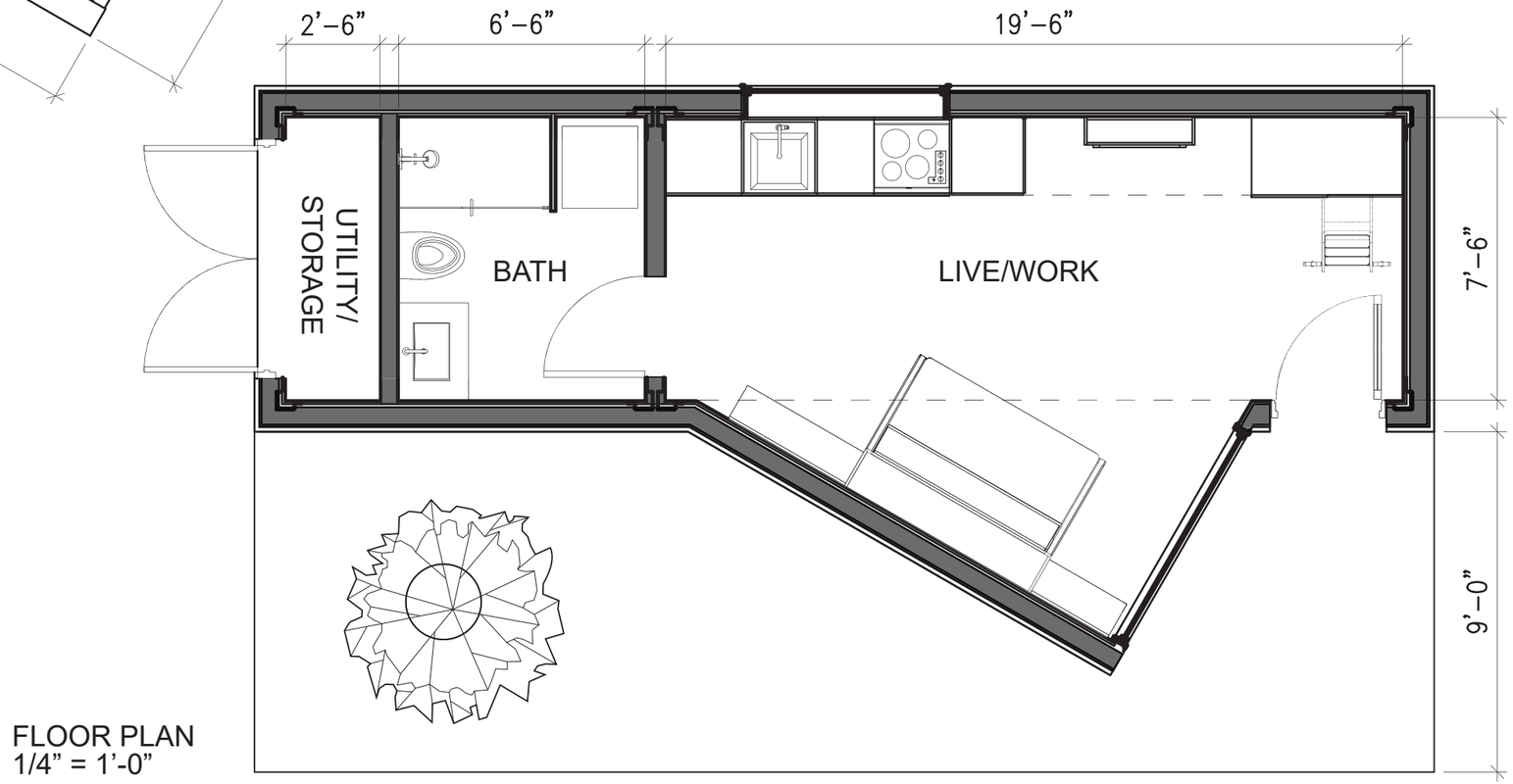
ROOF PLAN
1/4” = 1’-0”

BASE MODEL ASSEMBLIES

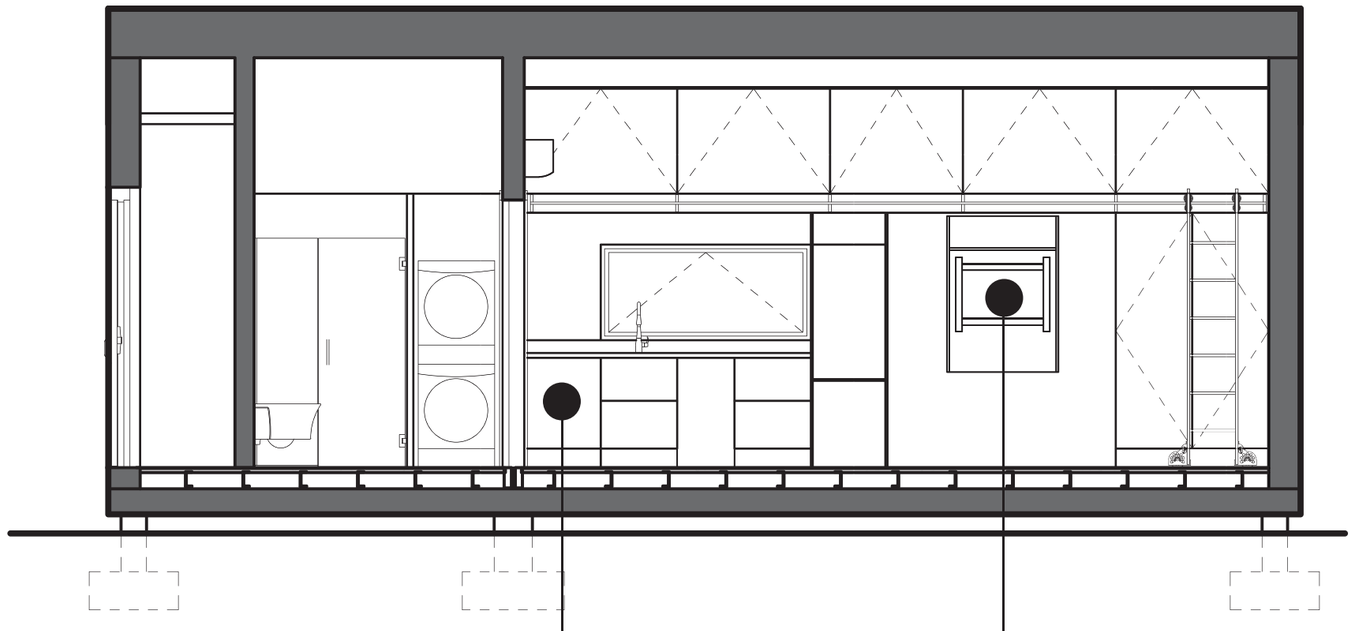
ROOF
- Standing Seam Metal
- R-49 Mineral Wool
- Fiberglass 2 Girts
- Fluid-Applied Water Barrier
- Corrugated Metal
- 1-1/2” Fiberglass Furring
- Finish Per Owner

FLOOR
- Standing Seam Metal
- R-30 Mineral Wool
- Fiberglass 2 Girts
- Fluid-Applied Water Barrier
- Corrugated Metal
- 1-1/2” Fiberglass Furring
- Finish Per Owner

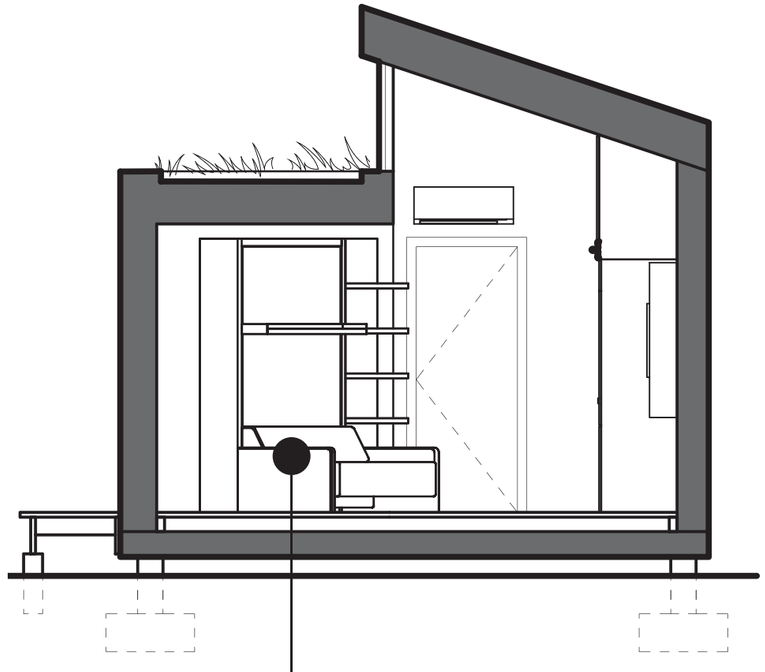
WALL
- Finish per Owner
- R-21 Mineral Wool
- Fiberglass 2 Girts
- Fluid-Applied Water Barrier
- Corrugated Metal
- 1-1/2” Fiberglass Furring
- Finish Per Owner



FLOOR PLAN
1/4” = 1’-0”



LONGITUDINAL SECTION
1/4” = 1’-0”



CROSS SECTION
1/4” = 1’-0”

ROLL-OUT WORKTOP
23” x 67” x 34”

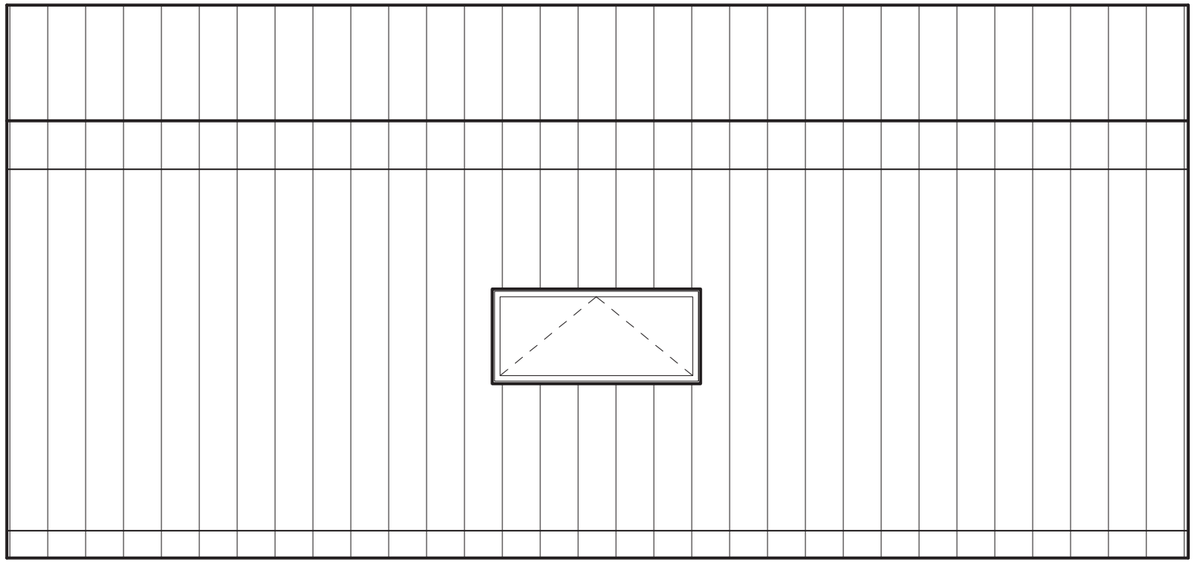
This retractable faux cabinet extends to reveal a four-foot worksurface, doubling the amount of worksurface in the HINGE HOUSE kitchen. Under the worksurface are shelves, ideal for pantry or other small storage.

TABLE PLUS
22” x 9” x 49”

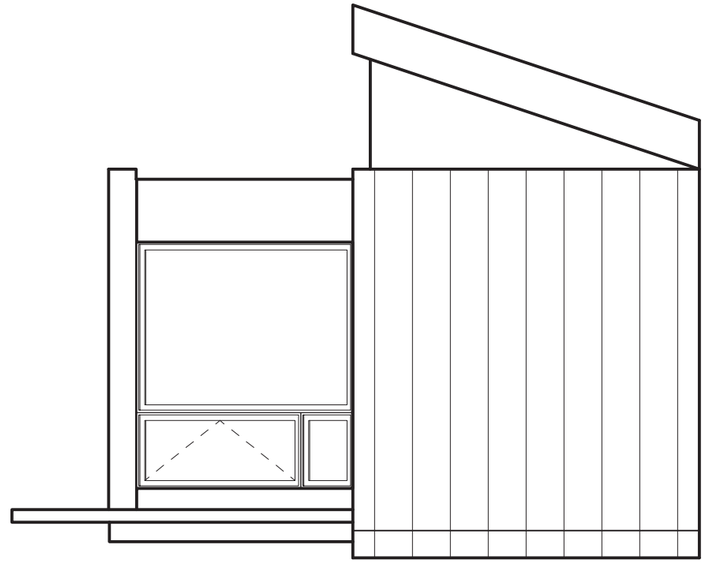
Folded, this table maintains a low profile against the wall to provide a little extra breathing room. Unfolded, it comfortably seats two to dine or one to work, with storage revealed for dishes or glassware.

OSLO SOFA
(OPEN) 85” x 87” x 87”

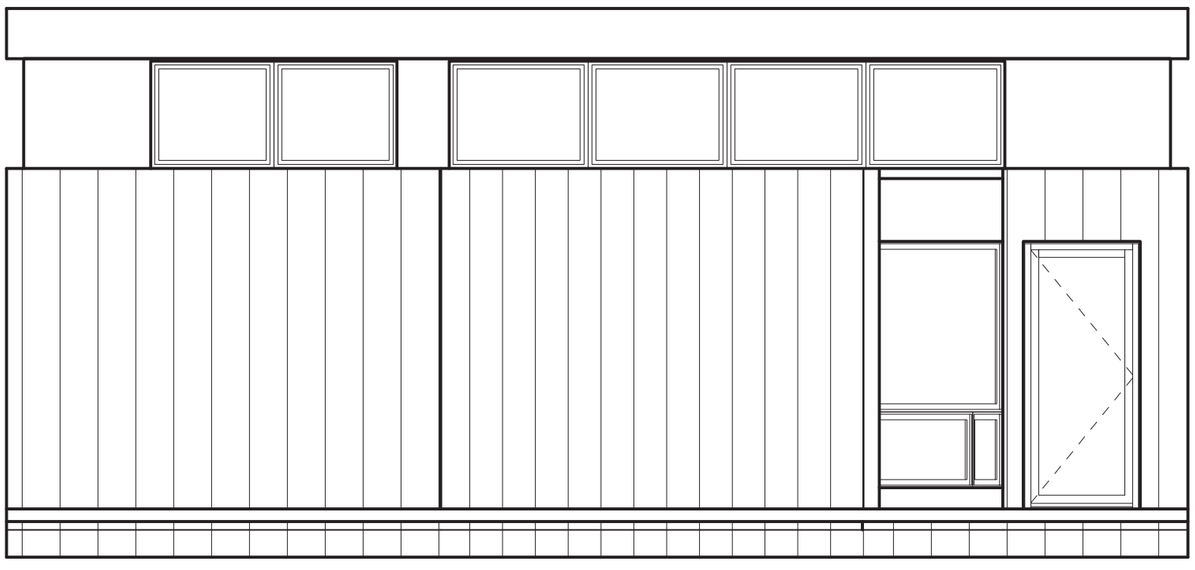
Traditional beds take up floor space, and sofa beds are an uncomfortable sleeping solution. Tucking a queen-size bed into a fold-down cabinet allows more space during the day and an easy transition to rest at night.



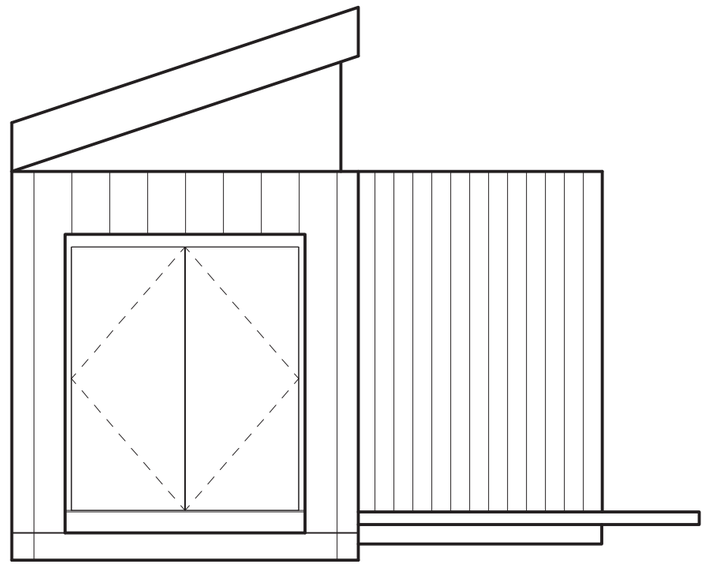
BACK ELEVATION
1/4” = 1’-0”



SIDE ELEVATION
1/4” = 1’-0”

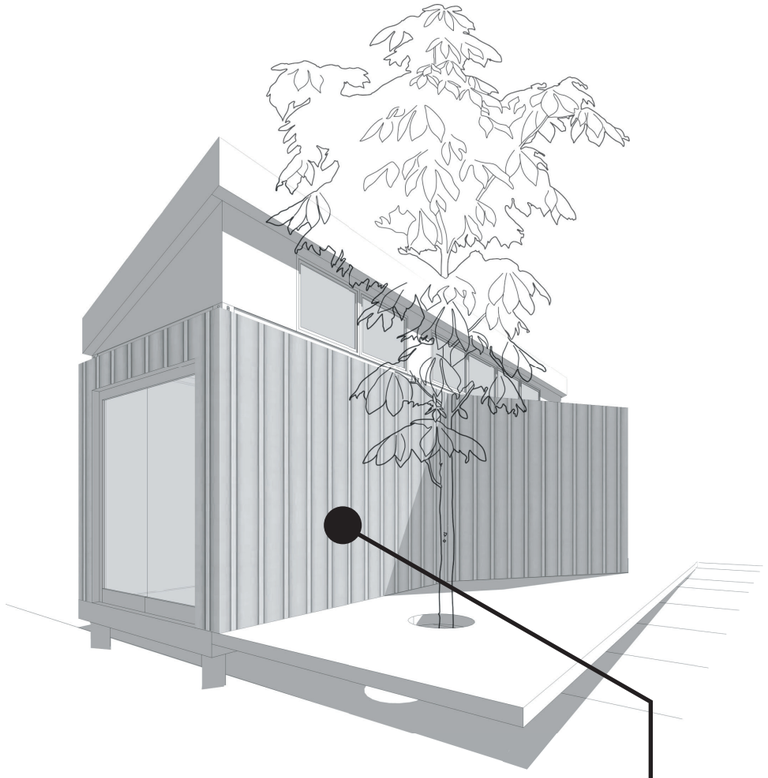


FRONT ELEVATION
1/4” = 1’-0”

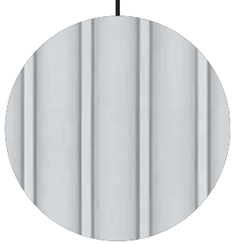


SIDE ELEVATION
1/4” = 1’-0”

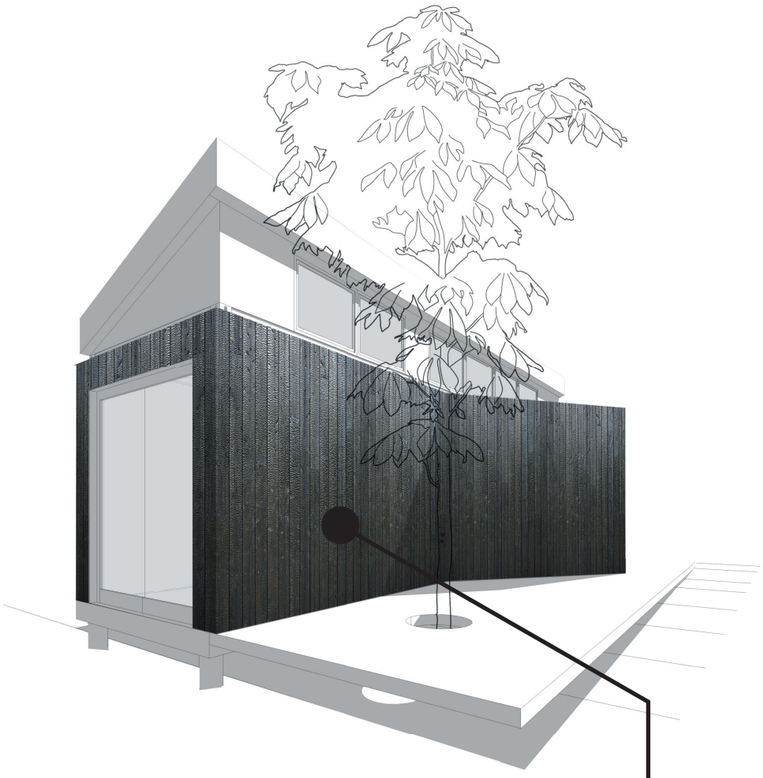
3D VIEW



OPTION 1: STANDING SEAM

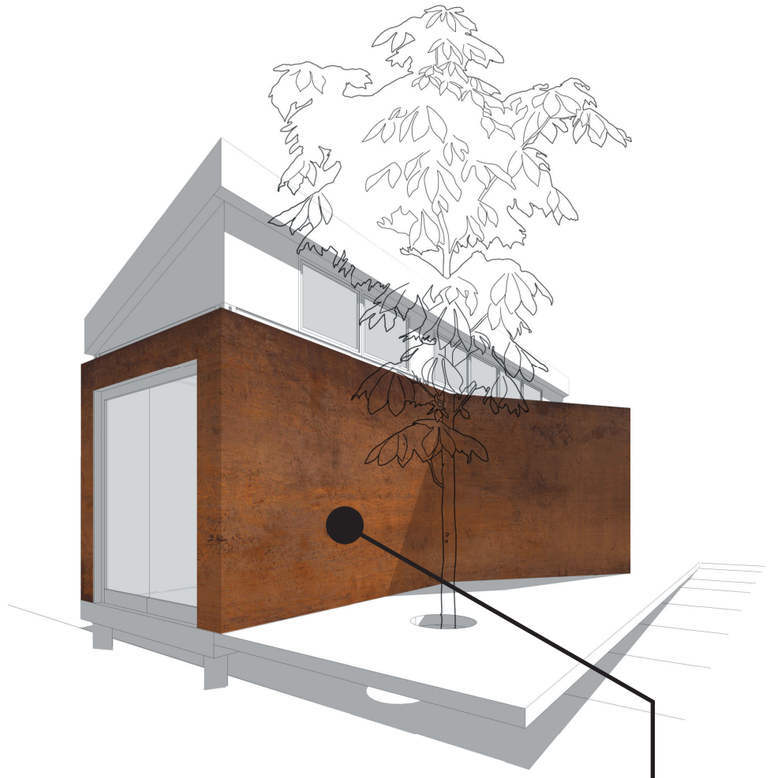


PRODUCT INFORMATION
This Pacific Northwest classic holds up well against wet and rainy winters while still being easy to install. The vertical orientation of the metal siding creates a texture and pattern that enhances the materials ability to shed water and protect the structure. It is also relatively lightweight and durable over long periods of time wheich helps to reduce maintenance costs and unforseen expenses.



OPTION 2: SHOU SUGI BAN

PRODUCT INFORMATION
Wood is charred to weatherize and strengthen the material while also creating an aesthetic finish that ranges in color from light gray to deep black. Originally a Japanese technique, Shou Sugi Ban offers both visual and textural components while also rising to the challenge of protecting against Pacific Northwest rainy winters, rot, and insects. Shou Sugi Ban serves as a carbon sink, is naturally insulating and a renewable resource which helps to reduce carbon across multiple stages of its lifespan.



OPTION 3: WEATHERING STEEL

PRODUCT INFORMATION
Through the interaction of sun, wind and rain on steel, a simple yet unique patten and patina appears and creates a one of a kind finish. The site conditions create a controlled rust reaction on the surface of the steel that changes over time while still maintaining its structural integrity. Weathering steel requires little maintenance, is durable long-term and completely recyclable.

ACTIVE SYSTEMS

LOW-FLOW FIXTURES AND RAINWATER RECLAMATION

The average toilet uses around 4000 gallons per year to flush. This can be reduced to 3250 gallons, or 20%, by switching to low-flow fixtures. All plumbing fixtures will be low-flow to reduce water use.

By capturing rainwater from the roof, it can be stored and used as greywater to flush toilets, irrigate landscape, and potentially wash clothes. An estimated 6300 gallons of city water would be saved and reduce utility costs.

EFFICIENT MECHANICAL AND ELECTRICAL SYSTEMS

The use of passive daylighting, cooling, and heating strategies significantly reduces energy needs for lighting and mini-split heating system and allows for more efficient use of both systems. To cover any additional climate comfort needs, an energy efficient Mini-Split heating and AC system* will be used.

If the owner choses to do so, solar panels could be added to the structure which has the potential to generate about 4000 kWh of energy per year. This would reduce energy use significantly for the structure and save money on utilities over time.

*Mitsubishi MSZ-GLO6NA Wall-Mounted Unit

SUSTAINABLE SYSTEM OPTIONS

STANDARD

Passive design strategies paired with a small building footprint and efficient plumbing and HVAC fixtures significantly reduce the HINGE HOUSE's energy and water needs compared to a typical apartment or small single family home. By using passive design strategies and capturing water on-site, HINGE HOUSE saves owners money on utilities long-term.

ADVANCED

If desired by the owner, HINGE HOUSE can reduce its environmental impact even further. The structure is designed to accommodate solar panels and battery storage installation. Rainwater collection can be sized up as desired and used to wash clothes in addition to toilet flushing. Extra insulation can also be added to create a super insulated envelope and reduce energy use.

PASSIVE DESIGN SYSTEMS

SUMMER STRATEGIES

MINIMIZING HEAT GAIN

Roof is angled to reduce heat gain during the day and is stacked to allow heat to rise on the interior and escape through the clerestory windows.

SHADING GREENROOF AND LANDSCAPING

Vegetation shades and filters light before it hits the structure and reduces cooling requirements. Incoming breezes are cooled when they pass through the vegetation before entering the structure.

CROSS VENTILATION

Using vegetation to shade and filter light before it hits the structure reduces cooling requirements.

WINTER STRATEGIES

MAXIMIZING SOLAR HEAT GAIN

The clerestory windows and roof are angled to maximize winter sun access to the interior of the structure.

SEASONAL LANDSCAPE

When temperatures drop, both the tree and greenroof grasses will drop their vegetation and allow more sunlight to pass and heat the structure.

THERMAL STORAGE

Using interior materials like tile floor will absorb heat from the sun in the winter and reduce the amount of energy needed to heat the space.

RAINWATER COLLECTION

All rainwater will be collected from the roof or stored in the greenroof to reduce runoff, increase infiltration, and be used with active system functions.