Net Zero Ready DADU

Pre-Approved Plans for Accessory Dwelling Units
Submission by

Alex Hale RA, CPHC
alex@alexhalearchitecture.com
319.721.5220
alexhalearchitecture.com
+
Nate Russell
nate.russell.arch@gmail.com
801.244.2350
nate-russell.com

We are independent practitioners with a shared mission of making good and responsible housing easy.
This proposal offers a solution that provides a solution for many homeowners who are responsibly trying to maximize the value their property and provide much needed housing.

Confronted with a growing environmental and housing crisis, this proposal provides a solution for homeowners wanting to increase the value of their property by providing a healthy, resilient, and responsible dwelling. Offering 2 bedrooms (optional 3), the building aims to accommodate multiple individual tenants or a small family with a compact, but generous layout.

Each component of the building meets strict performance requirements, ensuring passive reduction of energy demand. This building is planned to be net zero energy ready. The introduction of a rooftop photovoltaic array could provide all necessary net annual energy needs.

The building utilizes a precut timber frame, a prefabricated panelized enclosure, a malleable interior finish system, and a concise and efficient mechanical system. This unique combination of systems allows for optimized installation sequences, predictable quality of the thermal envelope, and interior flexibility.

Project Description

Net Zero Ready DADU

Overall Square footage
934 SF
Footprint
542 SF
Height
19’
Number of bedrooms
2+
Number of bathrooms
2

*Compatible with lots min of 50’ wide
*Requires Green Certification for additional 2’ of maximum height

Project information

LOW COST
This project optimizes value by providing an efficient high quality building for a lower cost through the combination of a compact floor plan and an accelerated construction sequence. The building's performance will additionally save homeowners on long term energy costs.

GREEN BUILDING AND DESIGN
One mission of this building is to provide the owner with the means of achieving a net zero energy development. The envelope has been designed within Passive House (PHIUS) guidelines. Further energy modeling and development with PHIUS or other energy efficiency programs will be pursued during the next phase of development. The building systems focus on reducing petroleum products and responsibly using accessible wood products for its structure. Intelligently sized and placed fenestration will provide passive solar heating with the correct orientation.

PRIVACY
Within a site, the NZR DADU can accommodate many orientations and positions due to its compact footprint. This allows for major openings to be strategically positioned toward private yards and allows facades with limited openings to face toward active edges.

CONTEXT
The presence of this building is meant to be a background element in a neighborhood context. Traditional siding can be used to appropriately adapt to the specific aesthetic requirements of the area. The neutral aesthetic of this modern building quiets its presence with simple expression and a comfortable material palette.

CULTURALLY RESPONSIVE DESIGN
By prioritizing changing housing needs, this home can be modified to provide 1 to 3 bedrooms. The flexible interior environment allows for ease of adaptability and configuration to the tenants' needs.

CONSTRUCTABILITY
This NZR DADU is intended to be prefabricated with a partnered fabricator, delivered to the project site, and installed without the need of a crane. The building systems (structure, envelope, finishes) are independent of one another. This allows for component optimization, flexibility and overlap in the construction process.

Project Narrative

Net Zero Ready DADU

Axon view of backyard

Alex Hale + Nate Russell

02.18.20

Building systems construction sequence

View of entrance and side yard

View of kitchen

Alex Hale + Nate Russell

02.18.20

View of living room

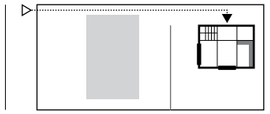
TOP NORTH
(TYPICAL)

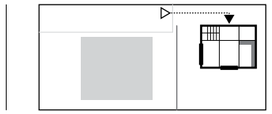
STANDARD

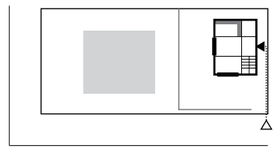
SIDEYARD DRIVE

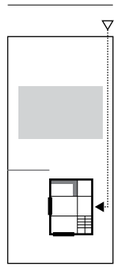
ALLEY

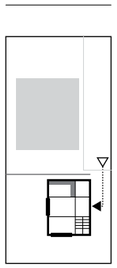
CORNER

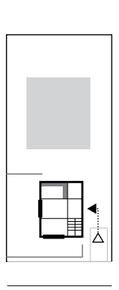


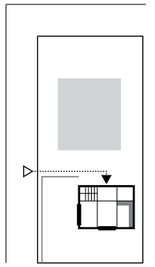


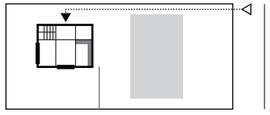


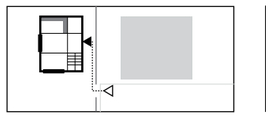


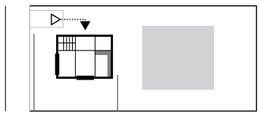


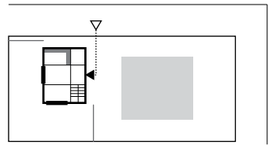


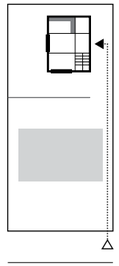


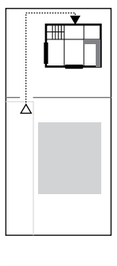


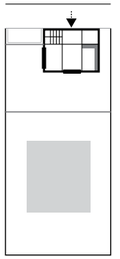


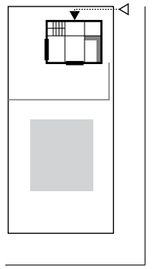




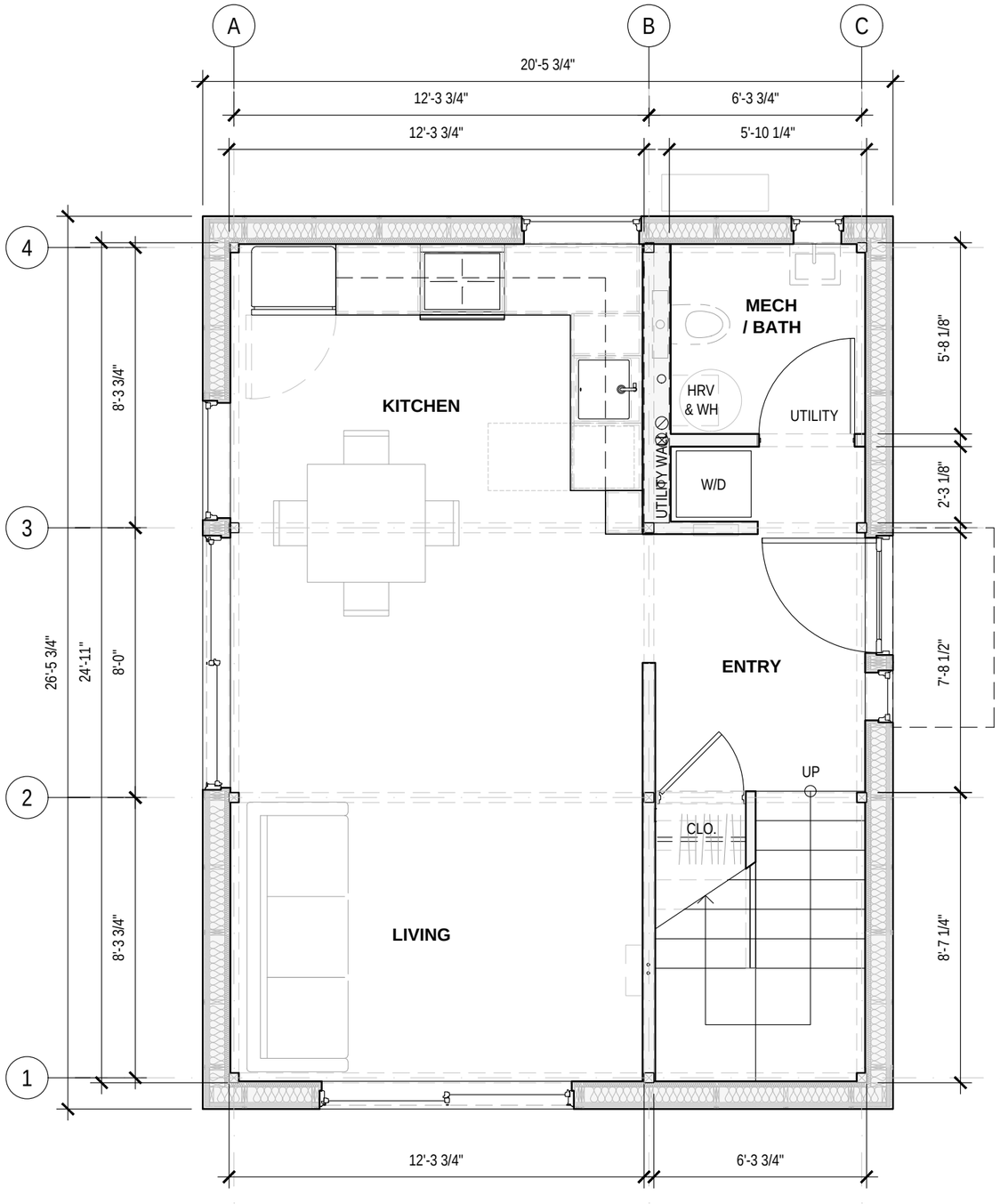








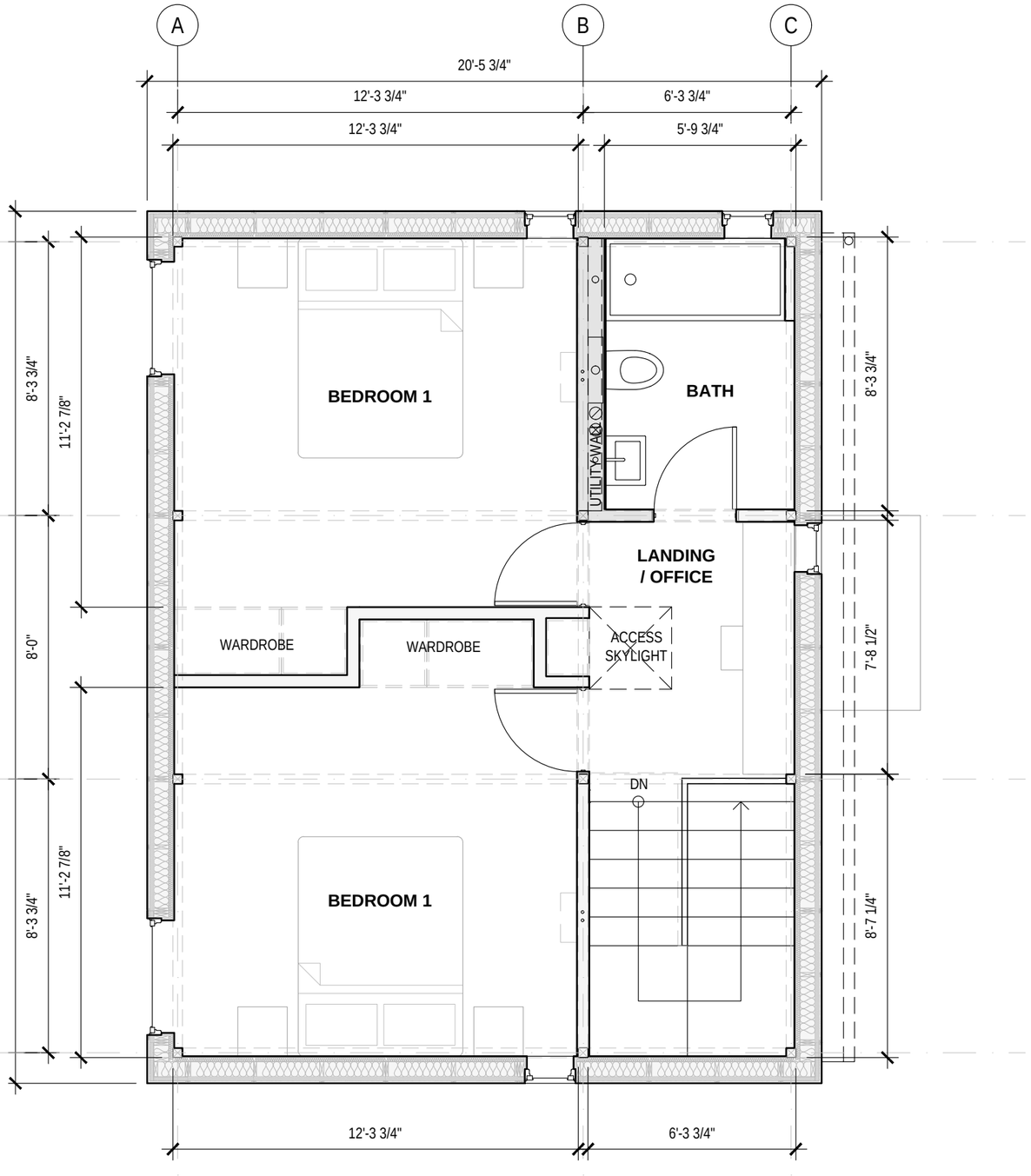
Possible DADU orientations



1 GROUND LEVEL

GROSS FLOOR AREA: 467 SF

SCALE: 1/4" = 1'



2 UPPER LEVEL

GROSS FLOOR AREA: 467 SF

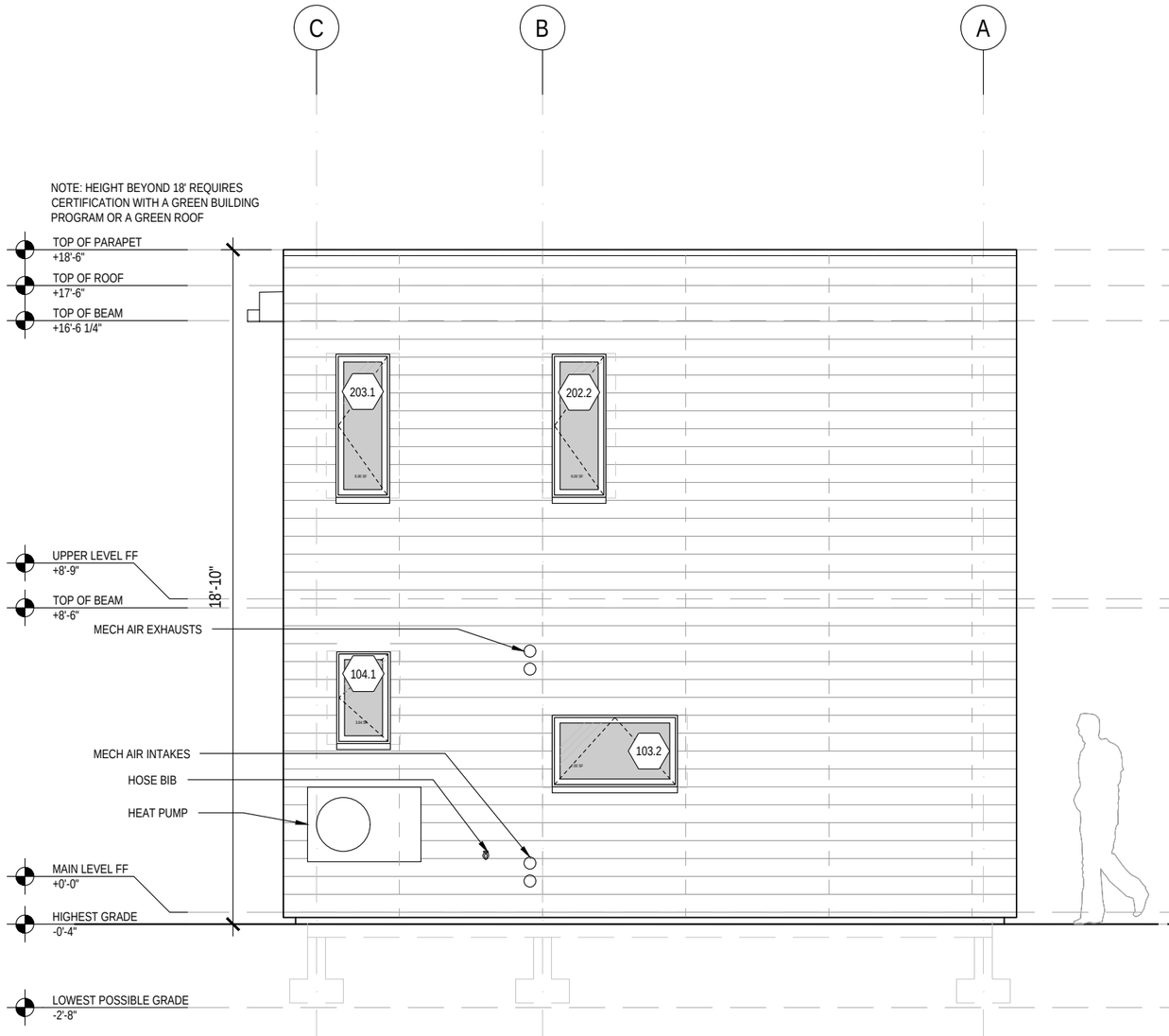
SCALE: 1/4" = 1'

1 WEST ELEVATION

SCALE: 1/4" = 1'

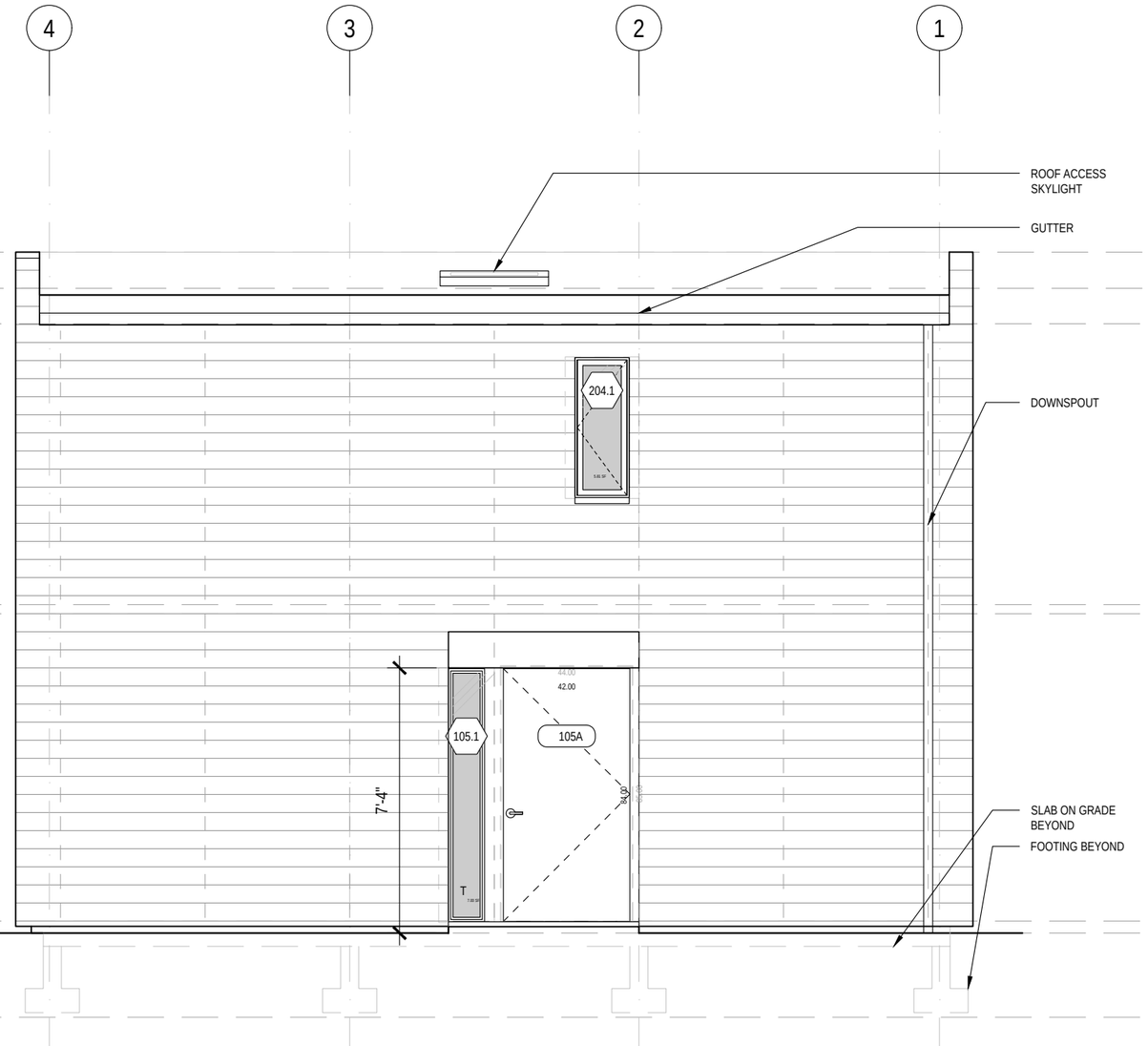
2 SOUTH ELEVATION

SCALE: 1/4" = 1'



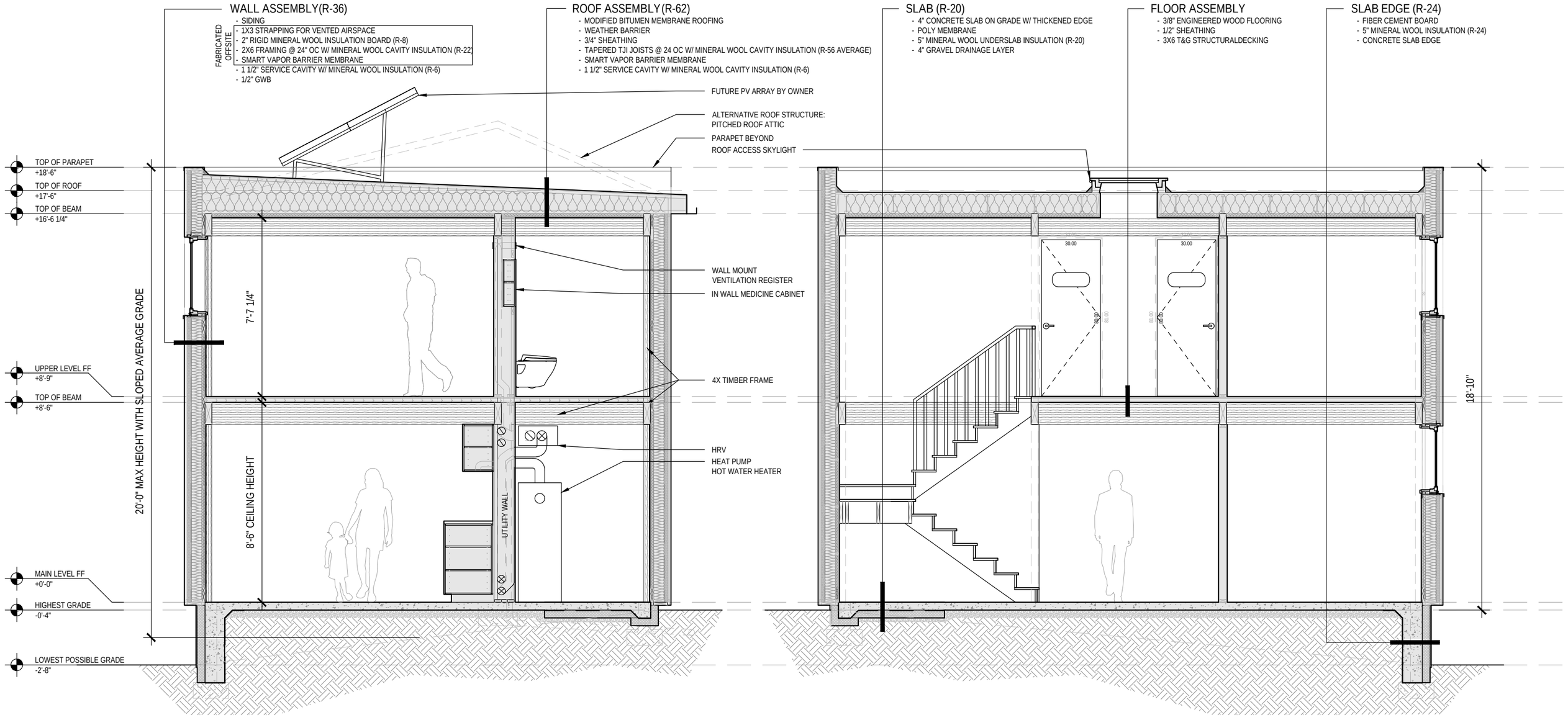
3 EAST OR NORTH ELEVATION

SCALE: 1/4" = 1'



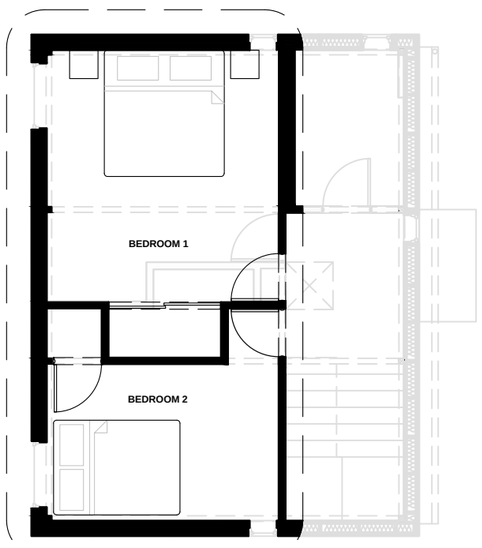
4 NORTH ELEVATION

SCALE: 1/4" = 1'



1 TRANSVERSE SECTION SCALE: 1/4" = 1'

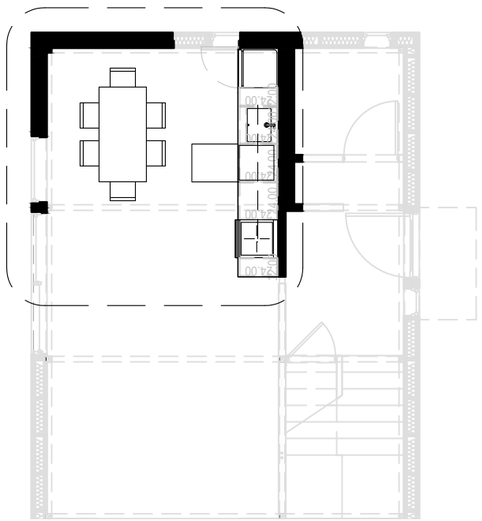
1 LONGITUDINAL SECTION SCALE: 1/4" = 1'

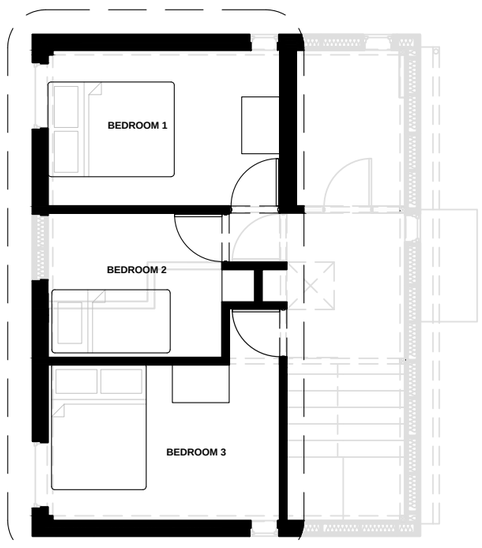


1 BEDROOM ALTERNATE 1

SCALE: 1/8" = 1'

LARGE ROOM AND SMALL ROOM

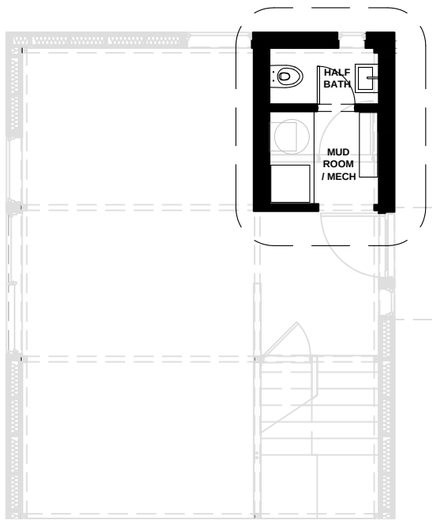


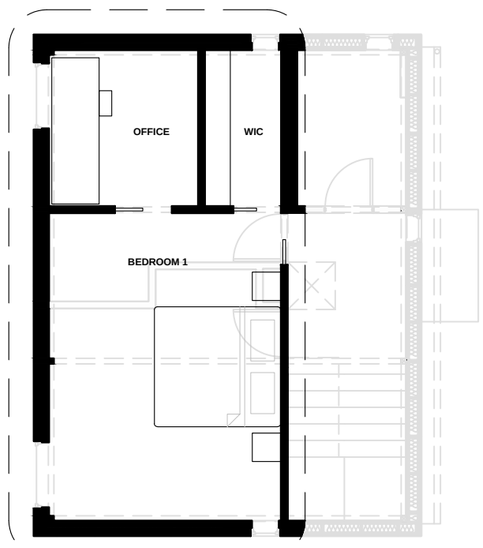


2 BEDROOM ALTERNATE 2

SCALE: 1/8" = 1'

3 SMALL ROOMS

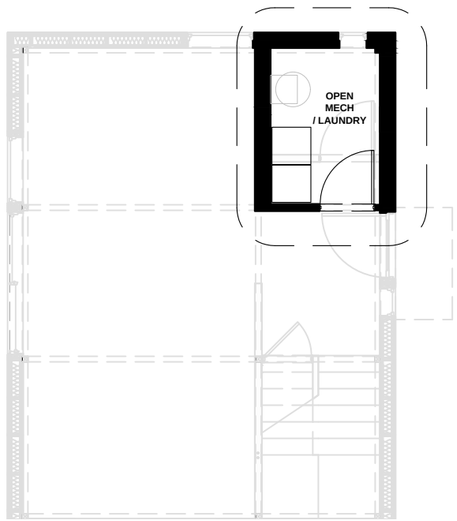




3 BEDROOM ALTERNATE 3

SCALE: 1/8" = 1'

OWNERS' SUITE



TIMBER FRAME
Posts: 4x4 hem/fir, full height
Beams: 4x12 hem fir
Hardware: Concealed Simpson hangers and post bases
Note: Preliminary structural design approved, but requires further development of lateral connections.
Shear resistance accomplished through lateral strapping, eliminating the need for wall sheathing.

CONCRETE SLAB
Standard mix concrete, floated and troweled, finished with a penetrating sealant
Note: This finish slab can be poured after the house is dried-in to limit construction damage.

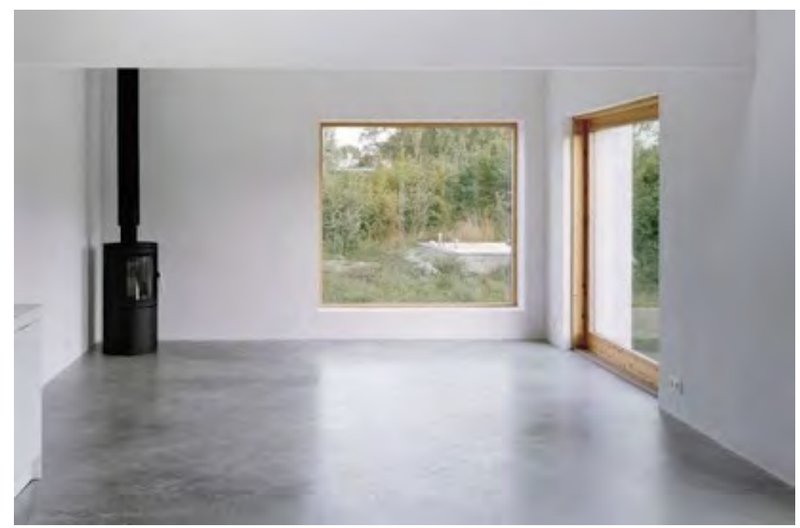
DECKING
3x6 Tongue and groove structural decking with ½” sheathing for structural diaphragm
Note: Requires structural design - possibly downsized to 2x6

FLOORING
⅜” engineered wood flooring,
Note: For upper level and stair treads

WALL FINISH
1/2” gypsum wall board.

TILE & OTHER FINISHES
Baseline finishes will be offered, but specialty interior finishes and furnishings are intended to be defined with the owner.

CABINETS
Kitchen cabinets are designed with standard dimensions, allowing owners to individually design and install a customized kitchen with their chosen system. A baseline design will be provided.



Interior Materials

Net Zero Ready DADU

SIDING
Cedar 1x6 T&G siding
Alternates in consideration: Fiber cement lap siding (horizontal), .5” corrugated metal siding (vertical), ribbed metal siding (vertical)

FENESTRATION
Loewen wood clad windows and doors. Current U value range: .14 to .18
Interior frame: mixed fir
Exterior cladding: Aluminum, color per client (clear aluminum shown)
Alternates in consideration: Alpen Windows, Marvin Windows, Intus Windows
Note: Patio door design considering swinging models as well as lift-slide doors. Likely one of the patio door positions will be replaced with a window depending on site orientation and yard access requirements.

ROOFING
Modified bitumen roll roofing
Alternates include: Low slope metal roofing

WALL PANEL FRAMING
2x6 wood framing @ 2

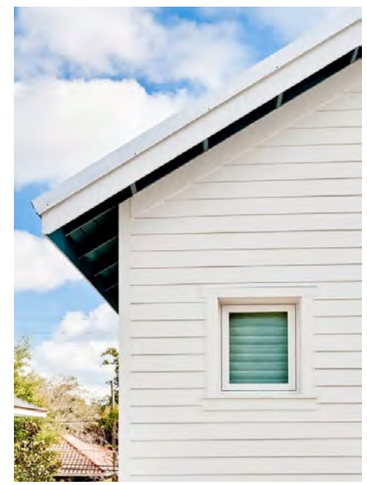
WALL PANEL EXTERIOR INSULATION
Rockwool Comfortboard 80
Alternates in consideration: Rockwool Multifix or Toprock, Gutex Wood FIberboard
Note: Exterior insulation board will provide temporary rigidity for prefab panel and act as the primary weather resistive barrier. Sheathing is not required in this assembly.

WALL PANEL CAVITY INSULATION
Rockwool Comfortbatt
Alternates in consideration: Dense pack cellulose insulation
Note: Includes cavity insulation for interior service cavities

VAPOR BARRIER
Pro Clima Intello Plus smart vapor barrier (air barrier)
Note: Preinstalled on interior face of panel framing

Exterior Materials

Net Zero Ready DADU



UTILITY WALL
A 2x6 utility wall provides space for organized installation of all utility distribution runs. All kitchen and bathroom spaces are immediately adjacent to this wall. Since plumbing lines are consolidated to this area, the utility wall could be fabricated offsite with all necessary rough-in requirements.

SERVICE CAVITY
A 1.5” furring layer of horizontal 2x2 framing allows for all electrical lines to be run without penetrating the interior air barrier of the wall panel. Additionally, the horizontal framing direction eliminates most thermal bridging locations within the enclosure. This space can accommodate bathroom lavatory drain lines if necessary.

DOMESTIC HOT WATER
Heat pump hot water heater
Current spec: Rheem Performance Platinum 50 Gallon Electric Hybrid Electric Water Heater
Note: 50 gallons may be more than required - considering smaller alternatives

VENTILATION
Ducted heat recovery ventilator to supply air to bedrooms and living room, return air from kitchen and bathrooms
Current Spec: LIfeBreath Metro 120d-ECM HRV
Note: Proper sizing required

HEATING
Ductless mini split - Air-to-air heat pump
Current Spec: Mitsubishi MXZ-3C24NA2 heat pump with MSY-GL09NA indoor units

POWER & LIGHTING
All electrical lines can be run in service cavity of interior wall furring. Lighting for the ground level will be provided by track lighting (or similar) with power coming through exterior perimeter beams.

PLUMBING
Pex tubing - 8’ max run for hot water distribution

APPLIANCES
All electric Energy Star appliances required. Future development will consider possibility of incorporating venting dryer and venting kitchen exhaust hood paired with direct make-up air system.

SOLAR READY
The electrical system will be designed for future (or immediate) installation of rooftop PV array.

Mechcanical Systems

Net Zero Ready DADU

MATERIAL SCOPE	MATERIAL COST
Concrete:	$4,460
Metals:	$1,910
Wood and Composites	$15,820
Thermal and Moisture	$12,030
Siding and Roofing	$11,770
Openings	$25,410
Finishes	$9,360
Cabinets	$2,200
Appliances	$6,600
Mechanical Equipment	$5,540
Plumbing	$3,230
Electrical	$4,760
Total	**$103,000**

EXCLUSIONS:

-Labor
-Profit and Overhead
-Site Specific Costs
-Permit Fees, Utility Fees, Etc.
-Design Fees

Estimate of Construction Costs

Net Zero Ready DADU