

Utility House

Family DADU



PROJECT DESCRIPTION

The *Utility House* is a 1-story, 2-bedroom, 1 bath unit. The house's central axis provides an effective division between social and private areas.

Living, dining and kitchen areas take advantage of a linear disposition for maximum connection with the backyard, daylighting and exterior access.

Two extended side walls provide privacy to the covered verandas, separating it from the shared backyard and offering a buffer with the neighbors.

The large glazing area is controlled by a shading device incorporated in the ceiling and truss design.

The roof is sloped for solar energy collection, and encloses a large attic space for additional storage and mechanical equipment. This frees up the plan, and accommodates the extra equipment required for a near net-zero passive house.

The house's solar access and large photovoltaic array is intended to provide surplus energy that the main house can utilize, thus the backyard cottage offsets the utility costs for the entire lot.

NARRATIVE

The *Utility House* fulfills the design criteria in the following ways:

LOW COST AND CONSTRUCTABILITY

- A simple, efficient layout eliminates hallways and yields a high usable vs. total buildable area.
- The plan configuration allows for the construction of a single central bathroom.
- The elevated verandas will conform to a variety of lot slopes, minimizing excavation and site work costs.
- Materials are chosen considering cost as well as durability, reducing maintenance and repair costs. Two finish package options are provided for different budgets and owner preference.
- A simple and flexible plan with standard construction methods encourages a partial DIY build project for the homeowner.
- The main facade is composed of fixed and standard size windows for cost reduction, with flanking dutch doors providing fresh air needs while keeping pets and children safe inside.

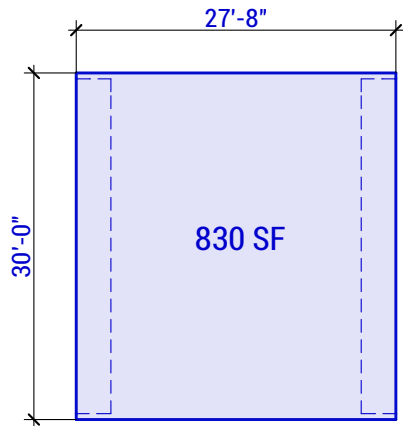
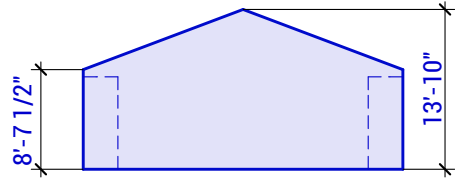
GREEN BUILDING AND DESIGN

- Wherever possible, proposed building materials promote indoor air quality, environmental sustainability, and incorporate recycled content.
- A symmetric and flexible plan configuration allows for favorable solar orientation, provides cross ventilation and maximizes thermal comfort.
- Rainwater harvesting is offered through a buried 500 gallon cistern.
- Efficient mechanical systems and possibility of incorporating an HRV system in the attic.
- Exterior rockwool insulation reduces heating and cooling demand.
- Roof slope and solar array offer to generate 6,470 kWh/year.

CONTEXT, PRIVACY AND CULTURALLY RESPONSIVE DESIGN

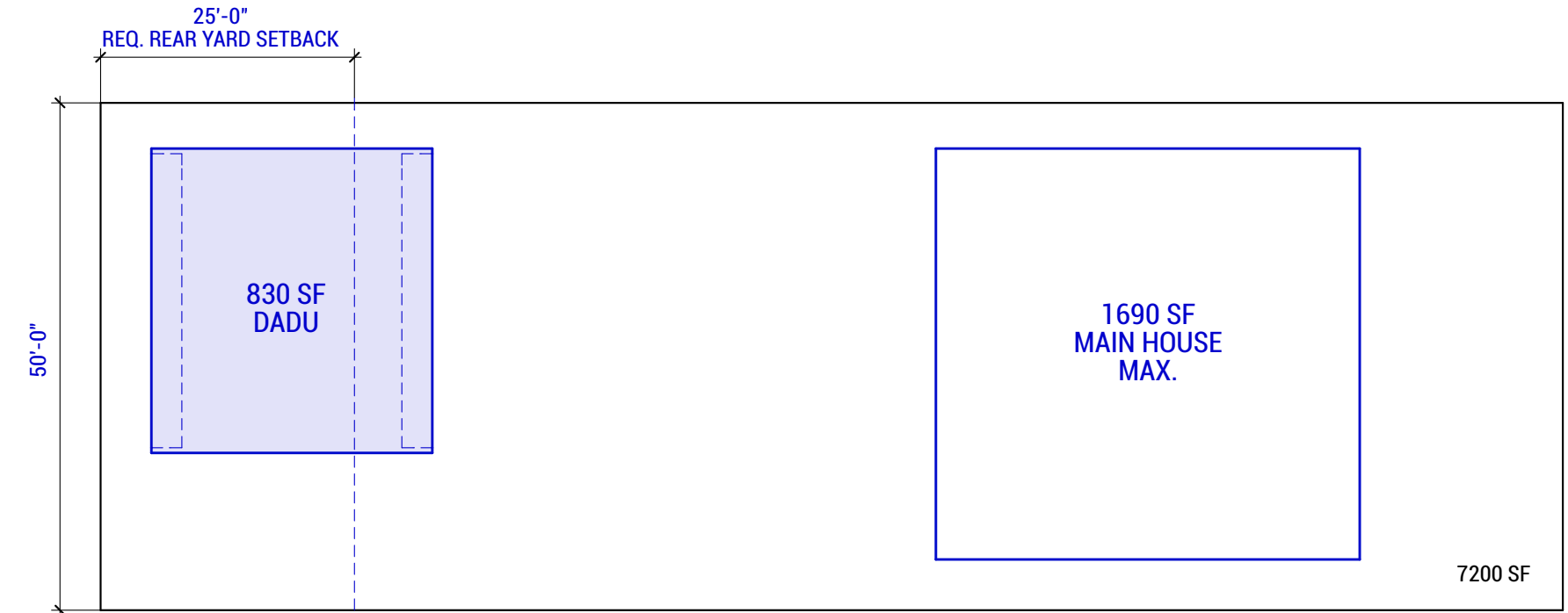
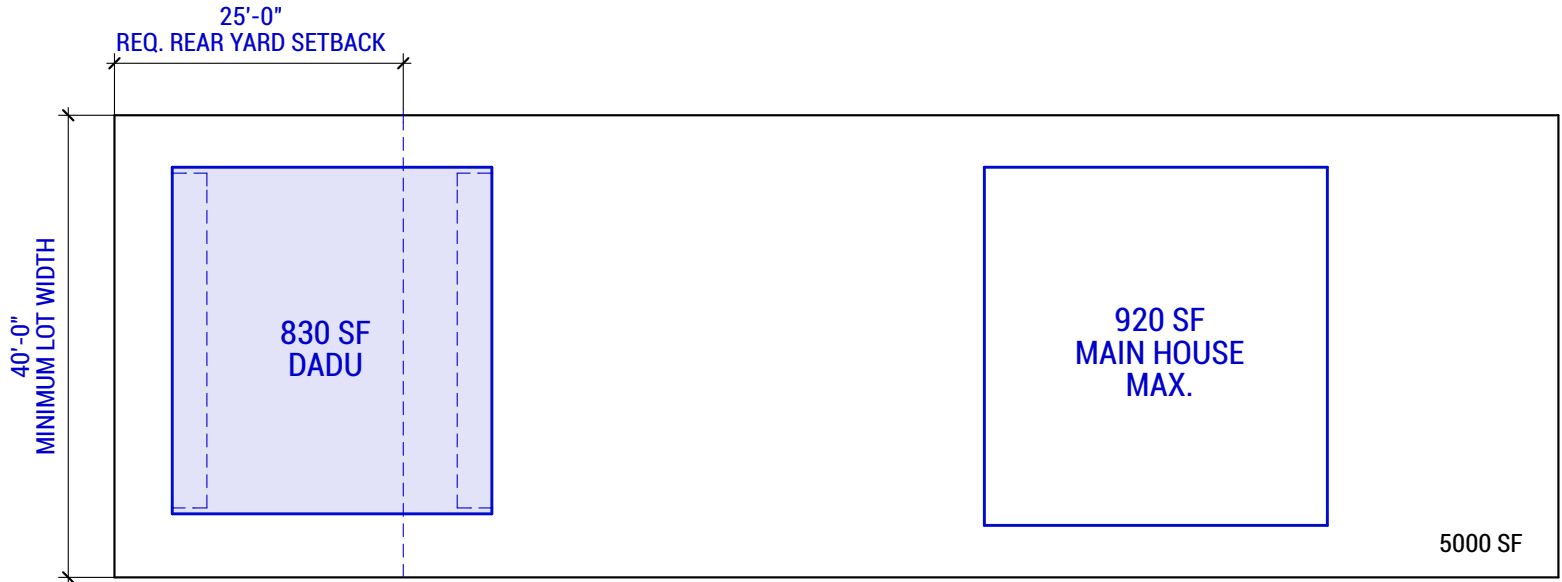
- A recognizable shape, clean outline, modular window placement and a low pitch roof, make the house adaptable to a wide variety of settings.
- The protected and elevated verandas create a semi-private exterior area for the owner to better enjoy the backyard.
- The large glazing area is controlled by interior or exterior shading devices incorporated in the ceiling/truss design.
- The closet/storage and bathroom areas provide a noise buffer between the rooms for their occupants.
- The social areas are left undivided, offering flexibility for various furniture arrangements.

PITCH - 13'-10"
BASE - 8'-7 1/2"



5000 SF LOT
≥ 40' WIDE
MAX. LOT COVERAGE:
1750 SF

7200 SF LOT
≥ 50' WIDE
MAX. LOT COVERAGE:
2520 SF



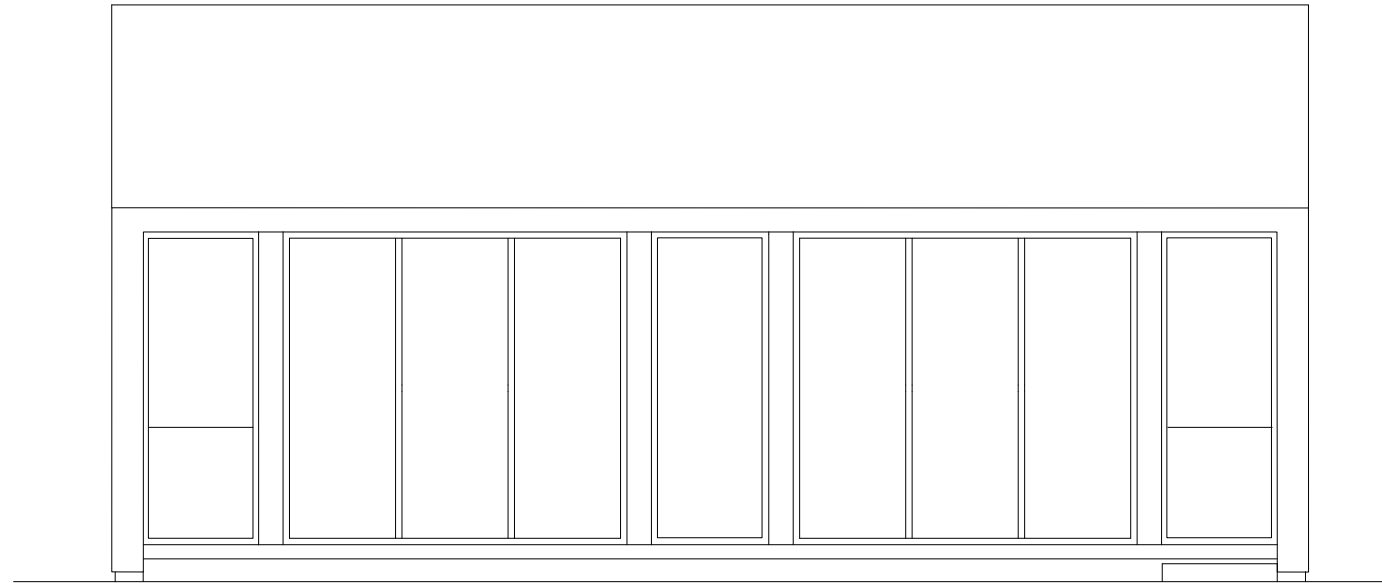
Considering a maximum of 60% rear yard coverage, minimum 5'-0" side yard setback, 20'-0" front yard set back, and 5'-0" principal structure separation.

DADU DIMENSIONS

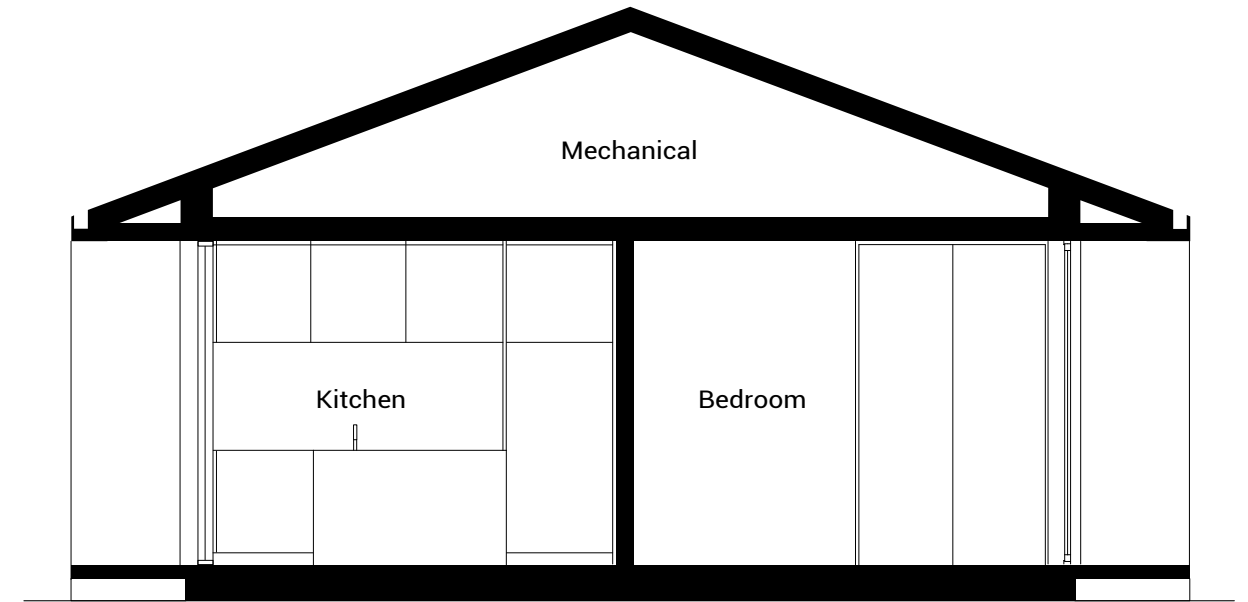
Plan Dimensions: 30'-0" x 27'-8"
Plan Dimensions (without eaves): 30'-0" x 21'-8"
Base height: 8'-7 1/2" at eaves, 9-7 1/2" at wall.
Pitch height: 13'-10" total @ 4.5:12 slope
Coverage area: 830 SF
Gross Area : 598 SF

LOT CONFIGURATION

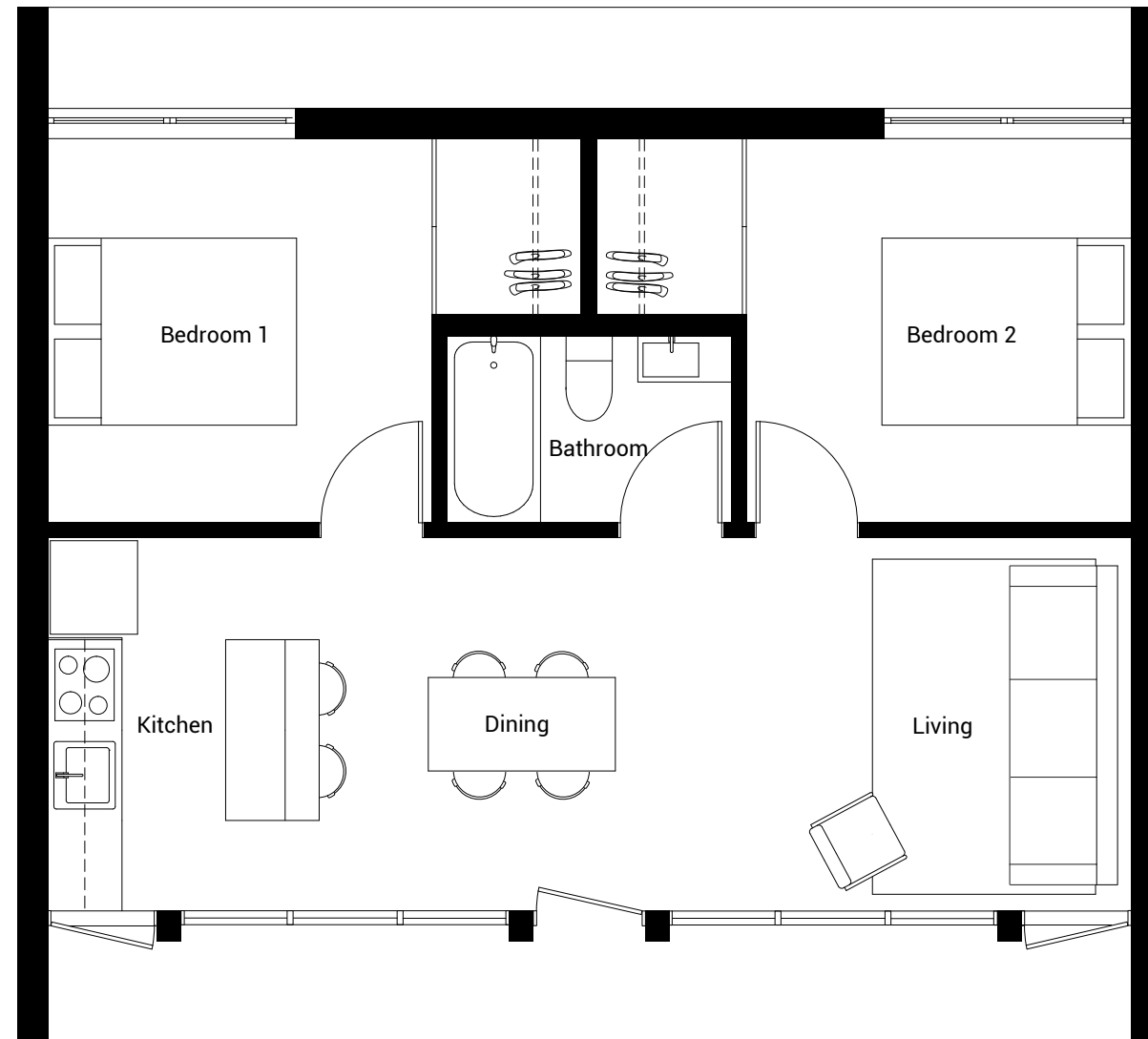
This 1-story cottage may be built on lots starting at 40'-0" wide. The exterior veranda may be removed in order to decrease the DADU coverage area.



FRONT FACADE



CROSS SECTION



PLAN

LIVING/DINING/KITCHEN - 289 SF; BEDROOM 1 - 106 SF;
CLOSET - 17 SF; BATHROOM - 38 SF; BEDROOM 2 - 106 SF;
CLOSET - 17 SF.



FRONT FACADE



LIVING/DINING

MATERIALS PALETTE #1- LOWER GRADE

EXTERIOR FINISHES

- ROOFING: Corrugated metal, painted.
- EXTERIOR SIDING: Corrugated metal, painted.
- BASE METAL FLASHING: Pre-finished aluminum.
- WINDOWS: Vinyl.
- WINDOW FLASHING: Pre-finished aluminum.
- EXTERIOR DOORS: Wood, stainless steel threshold.
- DECKING: Alaskan Cedar Hardwood Decking, 6" wide.

INTERIOR FINISHES

- FLOOR: Cast in place concrete, smooth trowel and penetrating sealer, matte finish.
- FLOOR BATHROOM: Micro-cement, wear resistant and waterproof.
- WALL FINISH: Painted GWB, level 5 finish.
- WALL FINISH BATHROOM: Painted GWB and colored plaster, wear resistant and waterproof.
- CEILING FINISH: Painted GWB, level 5 finish.
- BASEBOARD & DOOR TRIM: Douglas fir, semi-gloss finish.
- WINDOW & DOOR RETURN: Painted GWB. Hardwood sill.
- INTERIOR DOOR: One Panel, painted to match wall color.
- KITCHEN: IKEA Metod Cabinets (Fiberboard, Melamine) and wood counter top, or DIY minimal plywood cabinets with wood counter top.



MATERIALS: 1/2/3. Corrugated metal in grey or natural color. 4. Wood decking. 5. Plywood. 6. Concrete, matte. 7. Plywood and metal cabinetry. 8. White melamine and wood countertop.

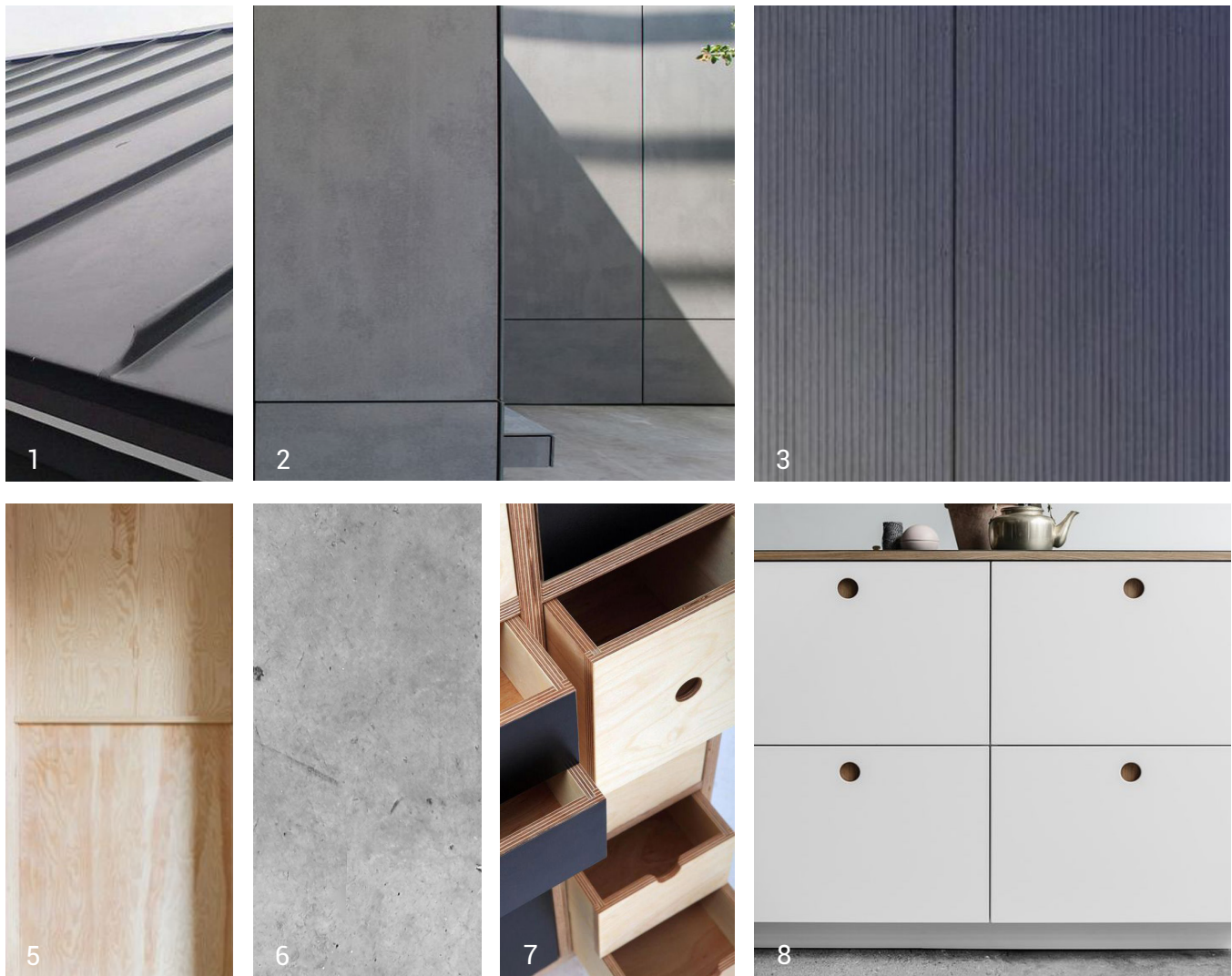
MATERIALS PALETTE #2 - HIGHER GRADE

EXTERIOR FINISHES

- ROOFING: Standing seam metal roofing.
- EXTERIOR SIDING: Integral color fiber cement panel.
- BASE METAL FLASHING: Pre-finished aluminum.
- WINDOWS: Aluminum-clad wood.
- WINDOW FLASHING: Pre-finished aluminum.
- EXTERIOR DOORS: Wood, stainless steel threshold.
- DECKING: Alaskan Cedar Hardwood Decking, 6" wide.

INTERIOR FINISHES

- FLOOR: Cast in place concrete, smooth trowel and penetrating sealer, matte finish.
- WALL FINISH: Painted GWB, level 5 finish.
- WALL FINISH ALL BATHROOMS:: Painted GWB and colored plaster, wear resistant and waterproof.
- CEILING FINISH: Painted GWB, level 5 finish.
- BASEBOARD & DOOR TRIM: Douglas fir, semi-gloss finish.
- WINDOW & DOOR RETURN: Painted GWB. Hardwood sill.
- INTERIOR DOOR: One Panel, painted to match wall color.
- KITCHEN: Plywood cabinets with linoleum face finish and paperstone counter top.



MATERIALS: 1. Standing Seam Metal Roofing. 2. Fiber cement integral color. 4. Fiber cement integral color with texture. 5. Plywood. 6. Concrete, matte 6/7. Plywood cabinets with plywood or linoleum face finish.

COST ESTIMATE

Includes the following:

- Site work (clearing, backfill, foundation)
- Framing
- Siding and roofing
- Plumbing rough-in
- Electrical rough-in
- Insulation
- Sheetrock level 5 finish
- Painting
- Gutter
- Stormwater collection
- Windows and doors
- Water heater
- Heat Pump
- Plumbing finish
- Electrical finish
- Kitchen appliances and bathroom fixtures
- Price includes 25% contractor overhead and profit margin
- * Does not include water and sewer connection.
- ** Final decisions regarding construction and finish materials, mechanical systems, window placement, roof height, and foundation design will be based on client preference and site information.

MECHANICAL SYSTEMS (Included in cost estimate)

WATER HEATER

40 gallon electric water heater. Rheem 4500 Watts. 240 Volts. Wall mounted (in attic). 23" diameter. 50" height.

Efficiency 0.93 Uniform Energy Factor (UEF)

HEATING AND COOLING

Mini split heat pump. 18000 btu. HSPF 10.

Mitsubishi MZ-HM18NA 18,000 BTU 18 SEER Ductless Mini Split Heat.

Table 406.2 Energy credits: 3B - Air source heat pump with min. HSPF of 9.0 - 1.0 point. (2015 WREC)

RENEWABLE ELECTRIC ENERGY

Solar array. Possibility of generating up to 6470 kWh/year, considering the full use of one roof faces.

For the purpose of the cost estimate, we are considering a 4kW system.

These results will vary based on location and orientation of the roof.

GREEN BUILDING FEATURES (Included in the cost estimate)

STORM WATER MANAGEMENT

500 gallon (64" diameter) rainwater harvesting tank.

SUSTAINABLE BUILDING MATERIALS

Zero VOC paint.

High density cellulose cavity insulation.

Mineral wool exterior insulation (min. R29 walls).

Paperstone (recycled paper and non petroleum resin) or wood counter tops.

Wood or Linoleum flooring.

Low flow fixtures.

Induction cooktop.

EnergyStar appliances.

OPTION #1 - LOWER GRADE FINISH ESTIMATE: \$125,530 (\$151.2/SF)

OPTION #2 - HIGHER GRADE FINISH ESTIMATE: \$147,337 (\$177.5/SF)

COST ESTIMATE: OPTIONAL PASSIVE HOUSE UPGRADE

ADDED FEATURES

Targeting 0.6 ACH Airtight envelope.
INTUS/ZOLA high performance windows and doors.

ALTERNATIVE WATER HEATER

40 gallon heat pump water heater. Reference brand: Hubbell. 28" diameter. 49" height.
EF 2.33 at ambient air temperature of 77 F.
Table 406.2 Energy credits: 5C - Efficient Water Heater - 1.5 points. (2015 Residential Energy Code).
(Optional Tankless Solar Water Heater)

HRV (HEAT RECOVERY VENTILATOR)

20 to 90 CFM Zehnder ComfoAir 160.
The CA160 is equipped with two class G4 filters (MERV 7/8). An optional class F7 pollen filter (MERV 13) is available for fresh air intake.
Height: 34". Width: 26.4". Depth: 10.6".

REMOVED HEATING AND COOLING

Given the volume of this Passive House and HRV system, the heating loads will be minimal and a mini split heat pump is not required for thermal comfort, other smaller heating options are available but unnecessary according to the preliminary PHPP results.

OPTION #3 - PASSIVE HOUSE UPGRADE ESTIMATE: \$152,298 (\$183.5/SF)

PRICE FOR STANDARD PLAN: \$1000

COST FOR HOURLY SERVICES: \$75



AHOUSE

Camilla Dahl, Emily Aune and Raquel Dias Ferreira

Designer: Alec Gardner

www.ahouse.studio . ahouseseseattle@gmail.com . t: 845-558-8347

KEY

XX
AXXX

DRAWING INDICATOR
DRAWING NUMBER
SHEET NUMBER

Z1

WALL TYPE INDICATOR
SEE SCHEDULE
FOR EXPLANATION

EXHAUST FAN

SD

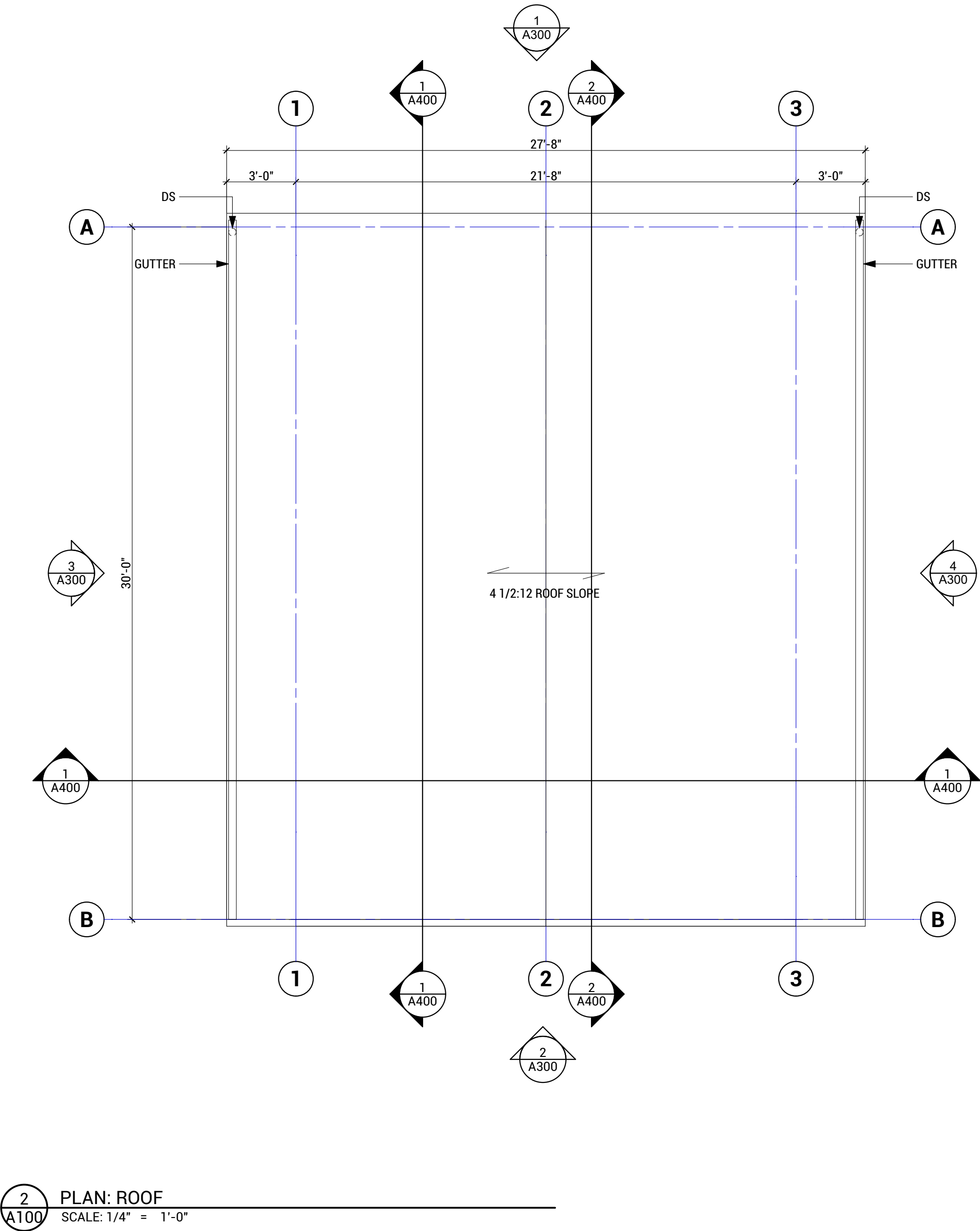
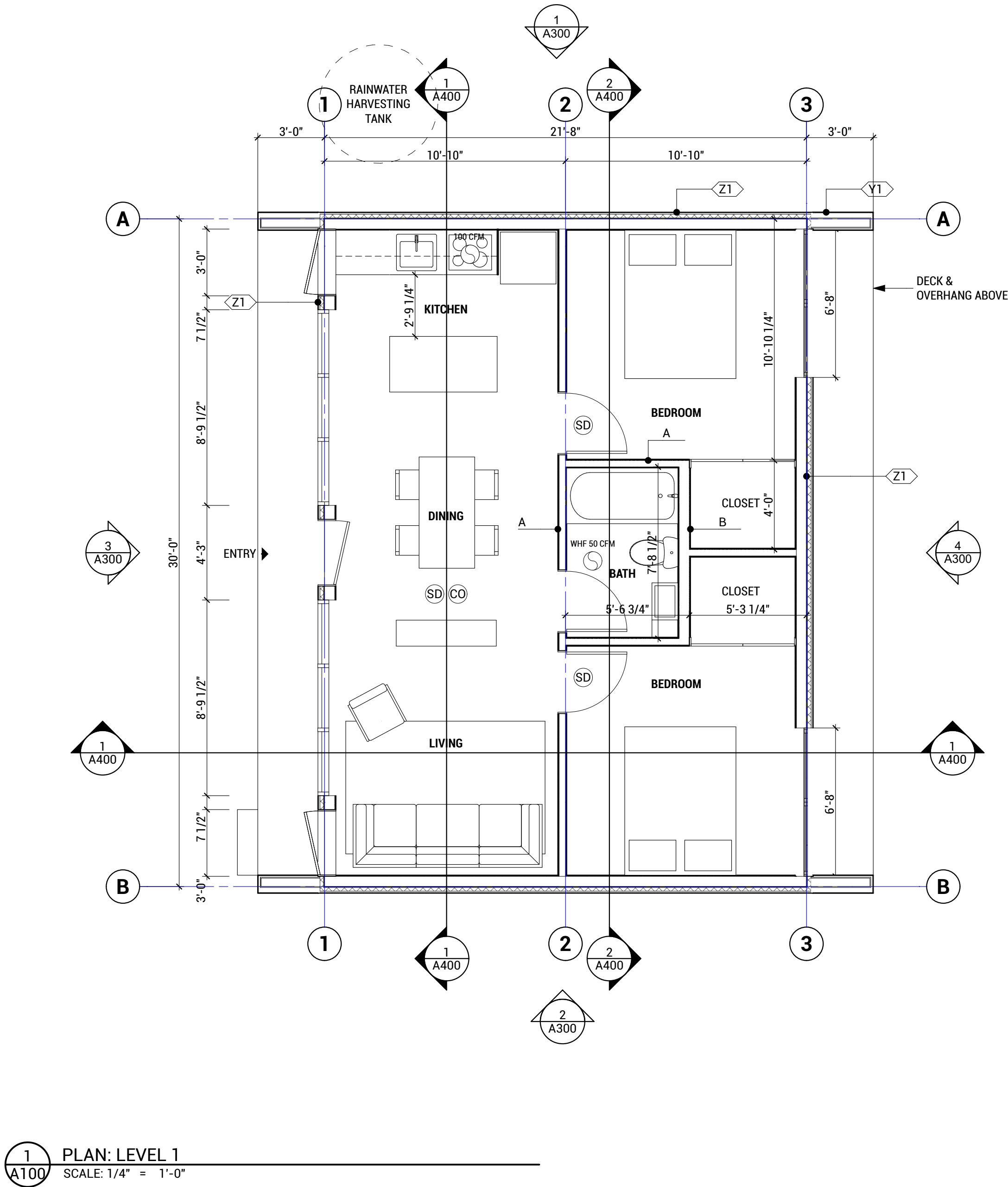
SMOKE DETECTOR

CO

CARBON MONOXIDE DETECTOR

ABBREVIATIONS

CLG	CEILING	TYP	TYPICAL
DADU	DETACHED ACCESSORY DWELLING UNIT	VTR	VENT THROUGH ROOF
DN	DOWN	W/D	WASHER AND DRYER
DS	DOWNSPOUT (EXTERIOR)	WD	WOOD
DW	DISHWASHER	WDW	WINDOW
EQ	EQUAL	W/	WITH
GWB	GYP SUM WALL BOARD	WSEC	WASHINGTON STATE ENERGY CODE
GYP	GYP SUM	WP	WATERPROOF(ING) MEMBRANE
HT	HEIGHT	WRB	WEATHER RESISTANT BARRIER
INSUL	INSULATION		
LE	LAUNDRY FAN EXHAUST		
MIN	MINIMUM		
MET/MTL	METAL		
OC	ON CENTER		
PLY	PLYWOOD		
PLYWD	PLYWOOD		
SF	SQUARE FEET		
SHTG	SHEATHING		
SL	SLOPE		
STUCT	STRUCTURAL		



DADU
Utility house

OWNERS:

DPD PROJECT #

PARCEL #

PROJECT DESCRIPTION
CONSTRUCT NEW 1-STORY
DETACHED ACCESSORY DWELLING
UNIT IN REAR YARD OF EXISTING
SINGLE FAMILY RESIDENCE

ADDRESS
SEATTLE

DESIGN
AHOUSE

NOTES

REVISION ID	CHANGE NAME	DATE

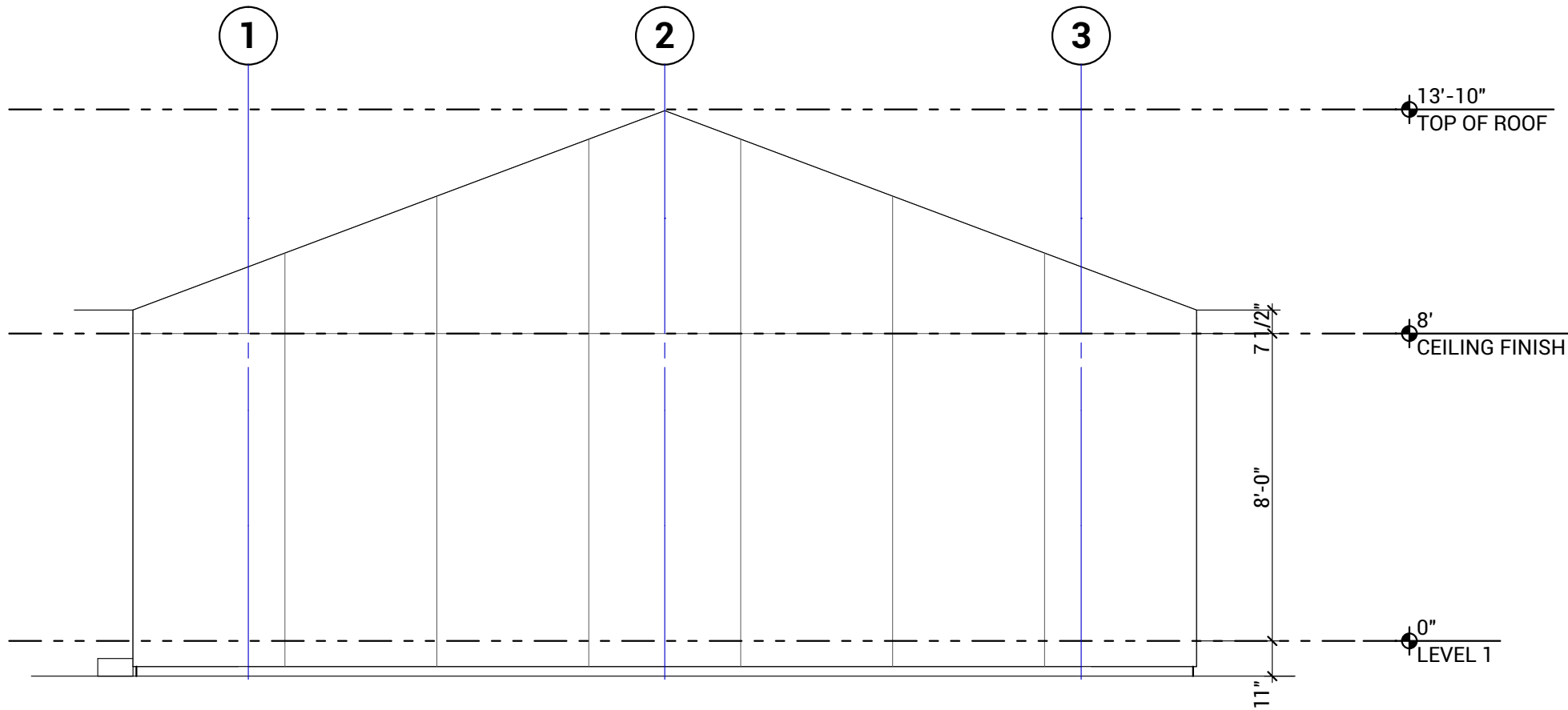
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DATE
DRAWN BY

DESIGN DEVELOPMENT
02/17/2020
AG

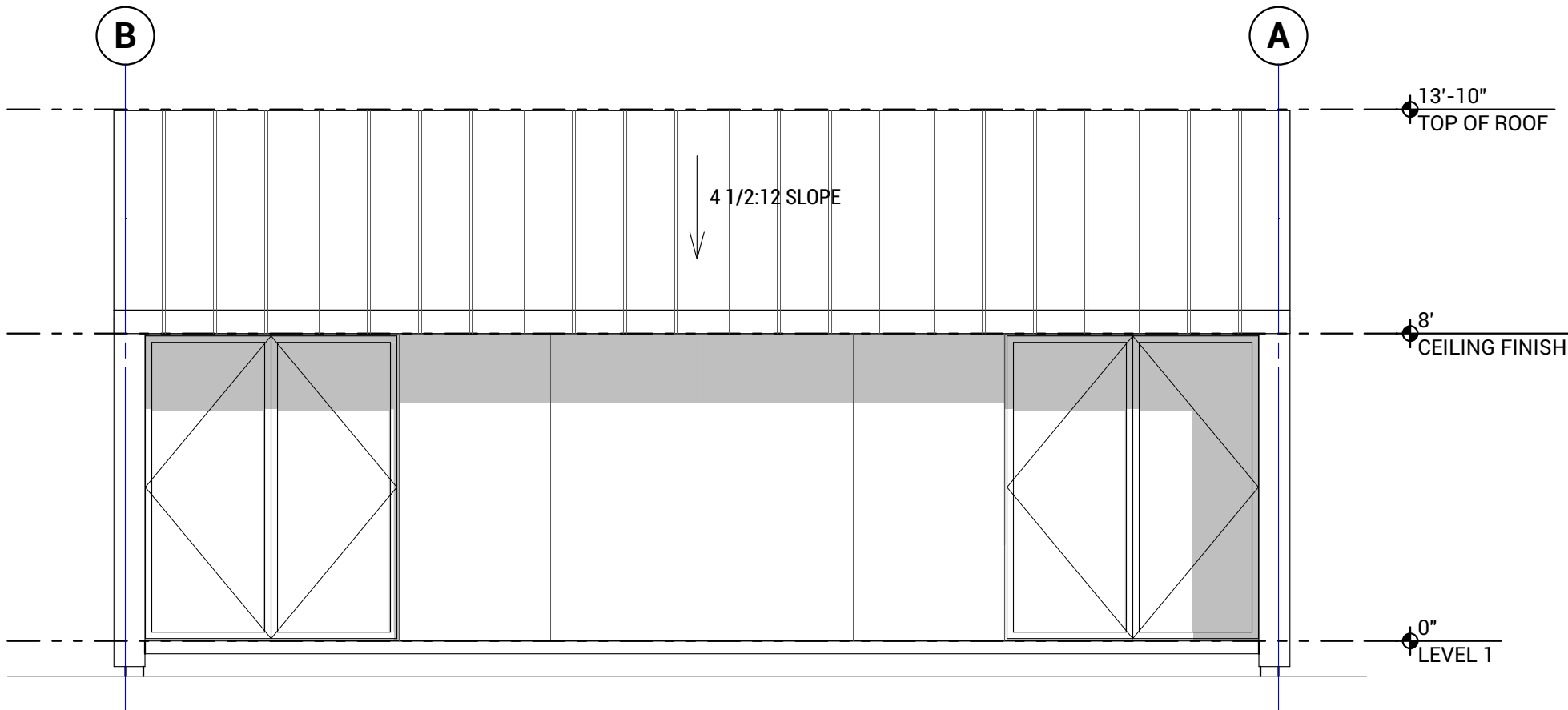
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PLANS

SHEET
SCALE

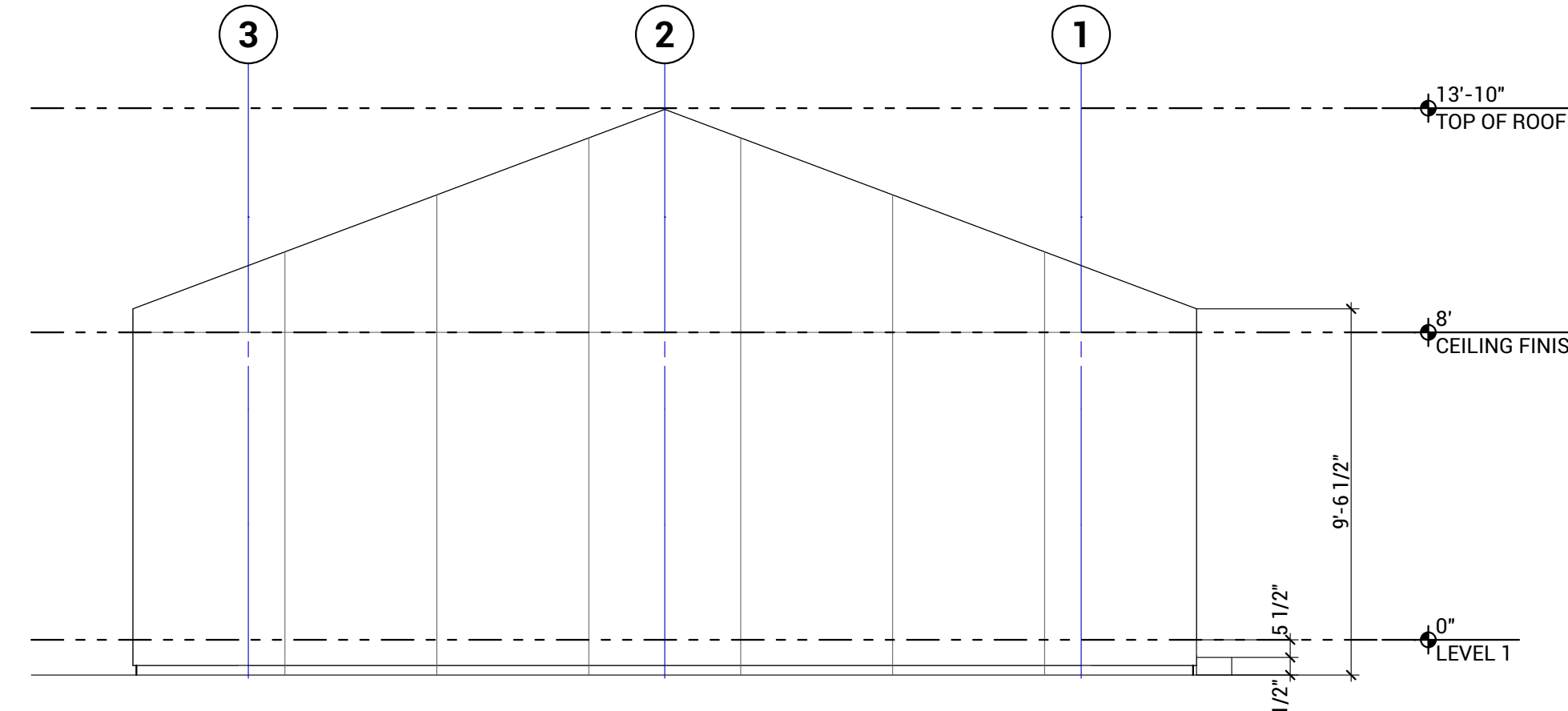
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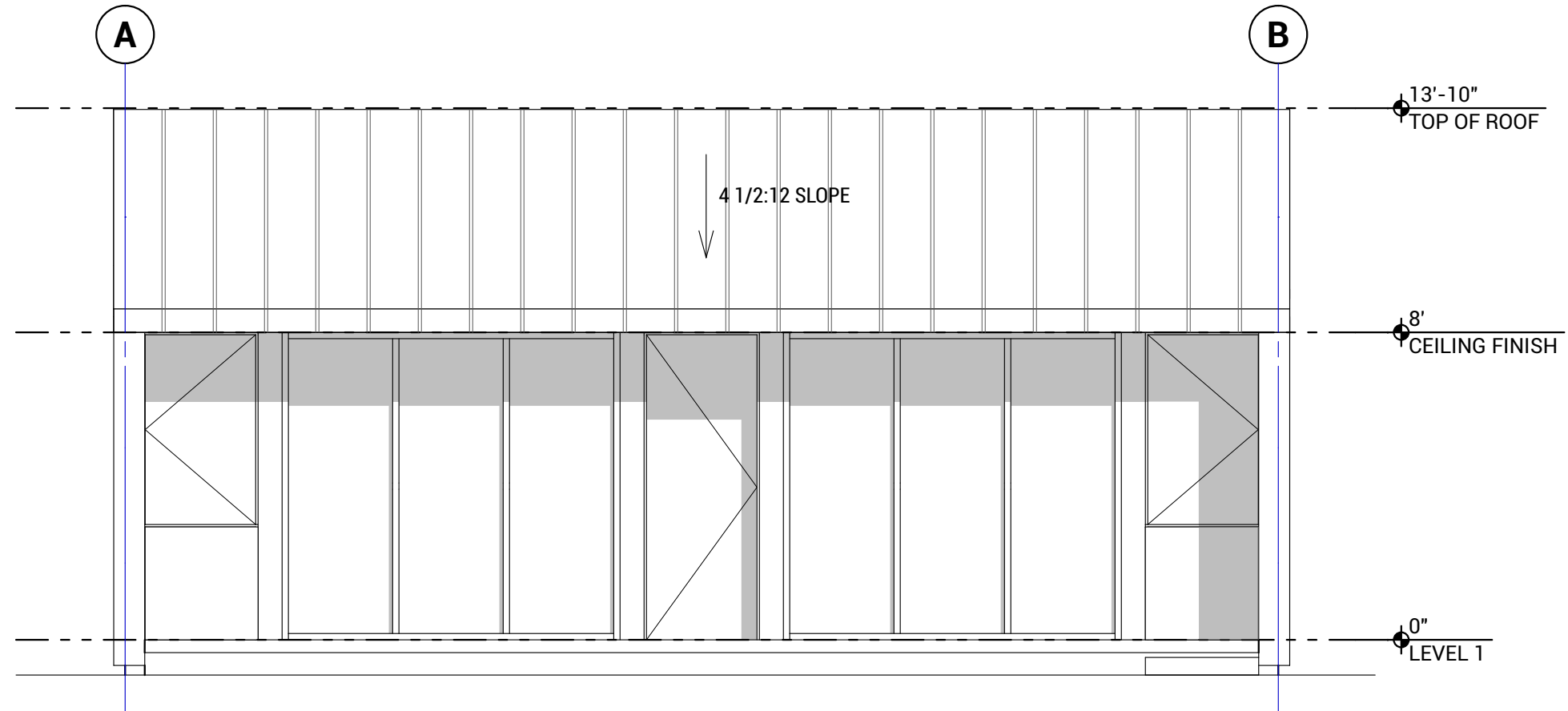
1 ELEVATION: SOUTH
A300 SCALE: 1/4" = 1'-0"



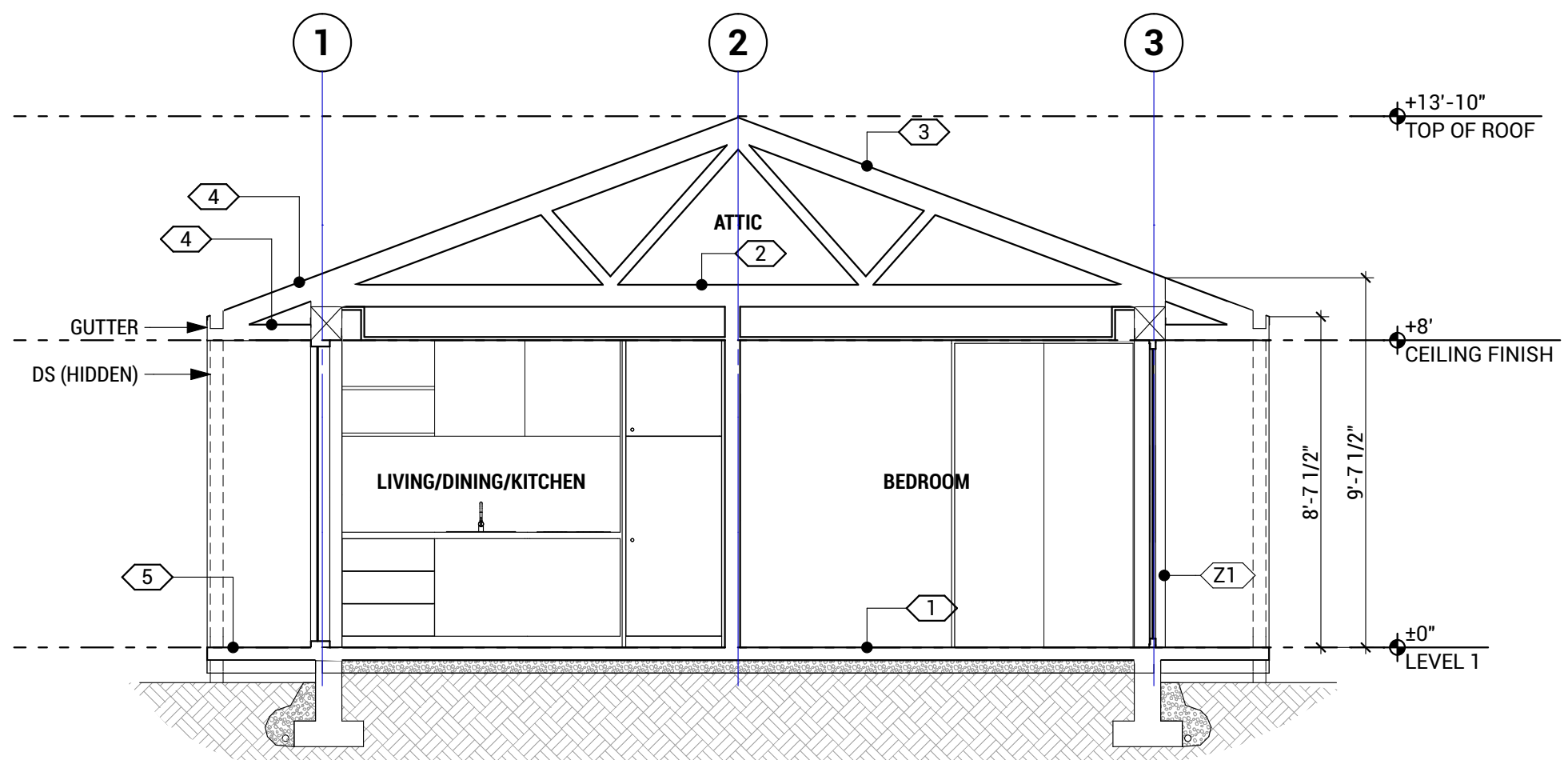
2 ELEVATION: EAST
A300 SCALE: 1/4" = 1'-0"



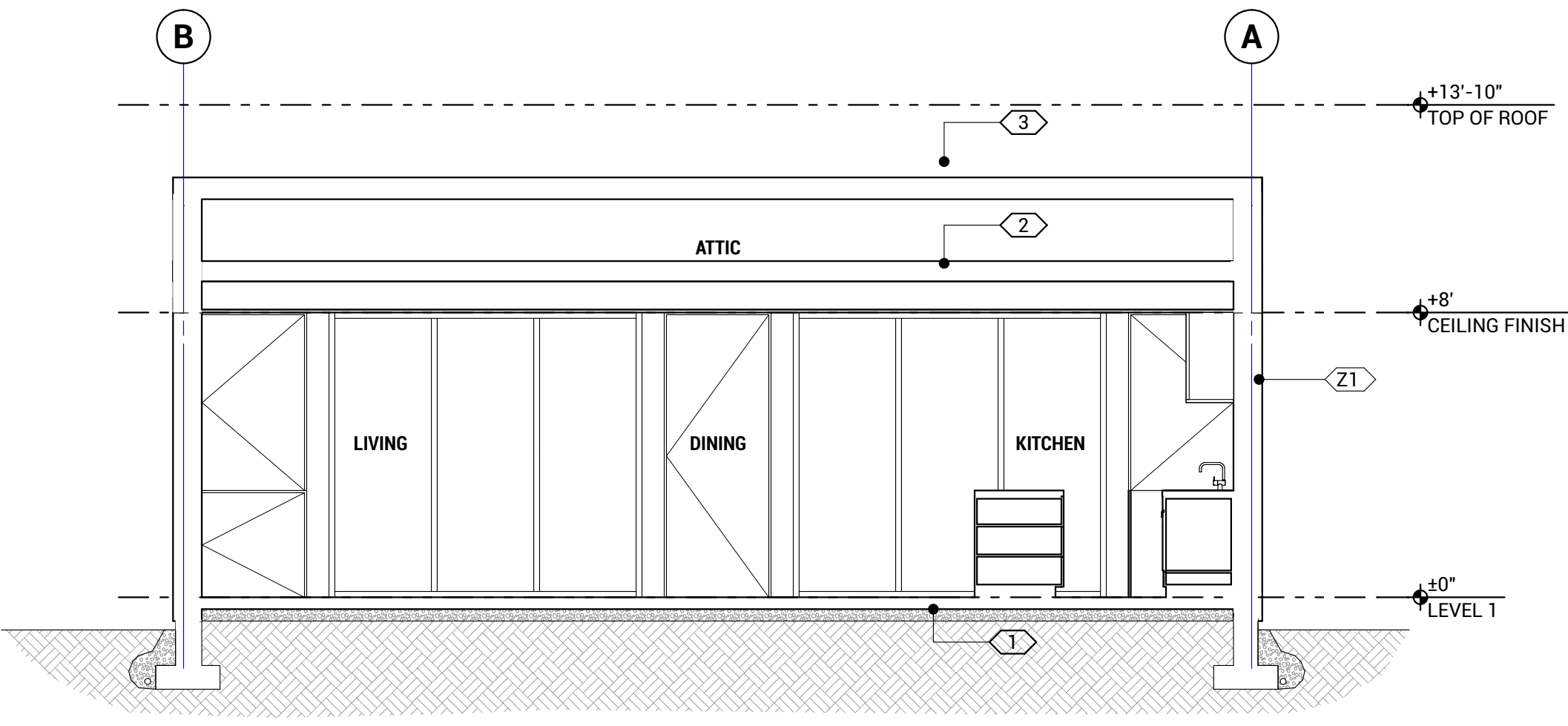
3 ELEVATION: NORTH
A300 SCALE: 1/4" = 1'-0"



4 ELEVATION: WEST
A300 SCALE: 1/4" = 1'-0"



5 CROSS SECTION
A300 SCALE: 1/4" = 1'-0"



6 LONG SECTION - LIVING
A300 SCALE: 1/4" = 1'-0"

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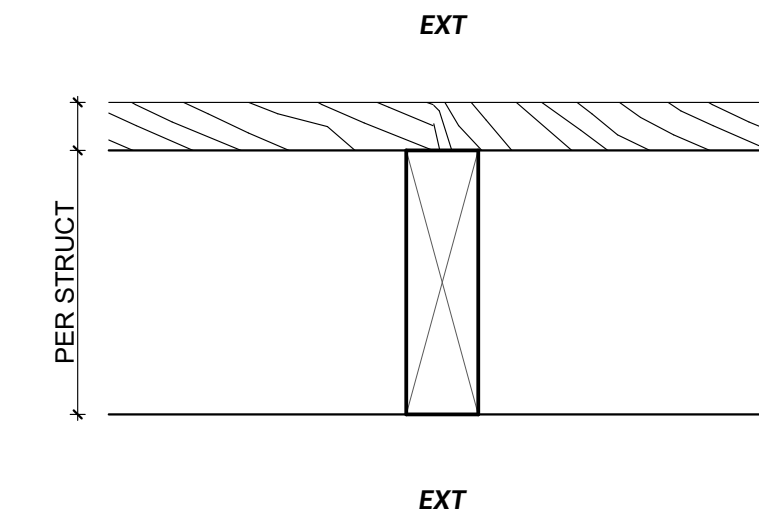
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ELEVATIONS & SECTIONS

SHEET

A300

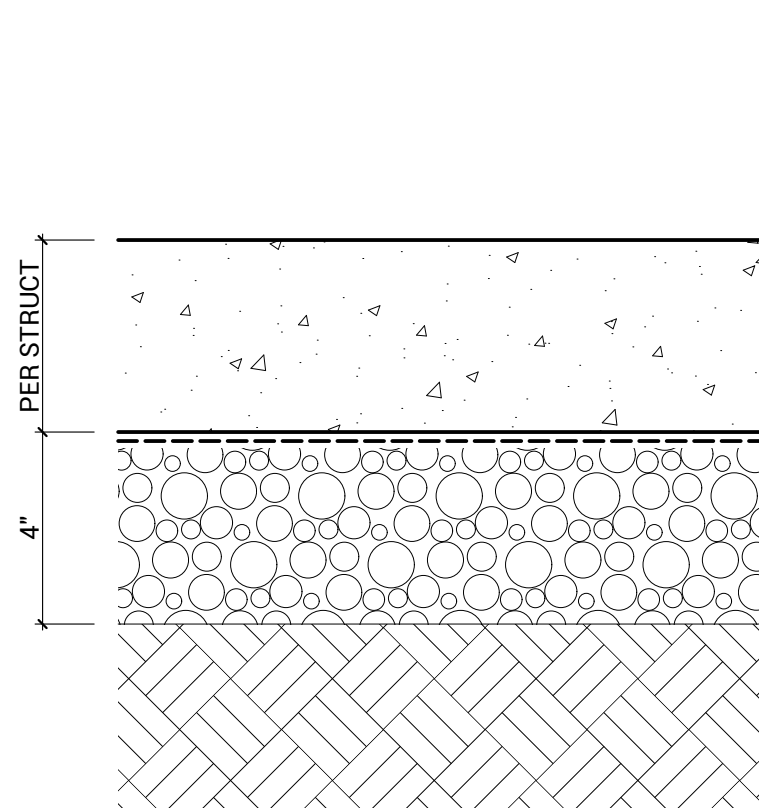
SCALE

AS INDICATED



5 WOOD DECK

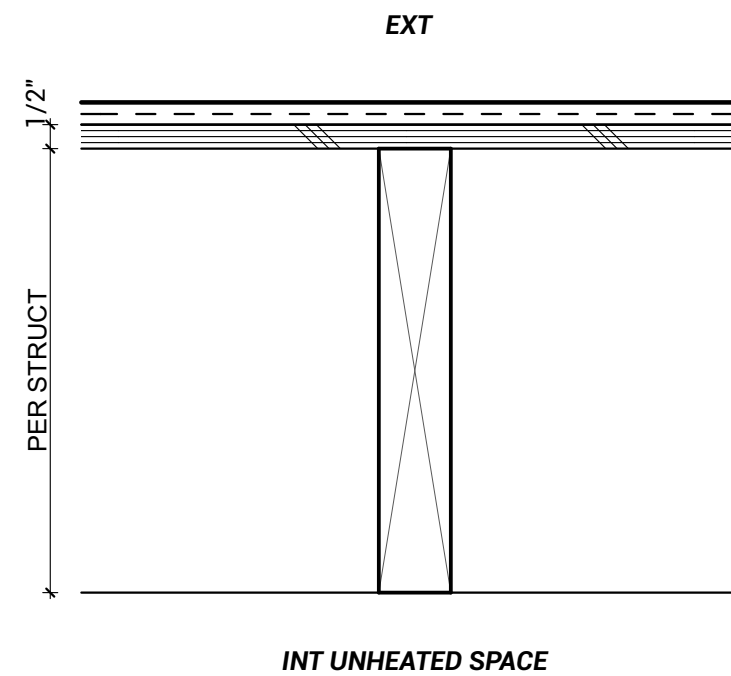
- DECKING
- 2X WOOD JOISTS (PER STRUCT)



1 TYP. SLAB ON GRADE

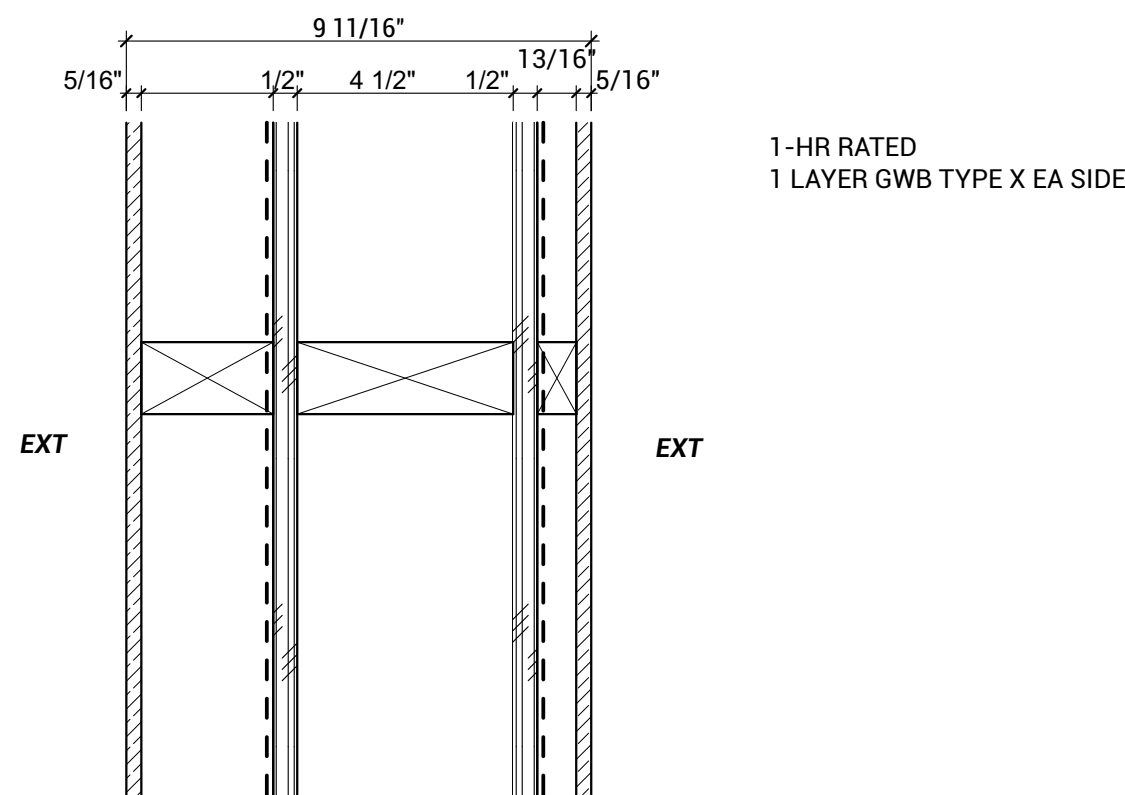
- CONCRETE SLAB
- PER STRUCT
- VAPOR BARRIER
- 4" MIN GRAVEL STRUCTURAL FILL

PROVIDE R-10 RIGID INSUL 24" WIDE @ PERIMETER OF SLAB BELOW HEATED SPACE, AND EXTENDED DOWN TO TOP OF FOOTING, TYP



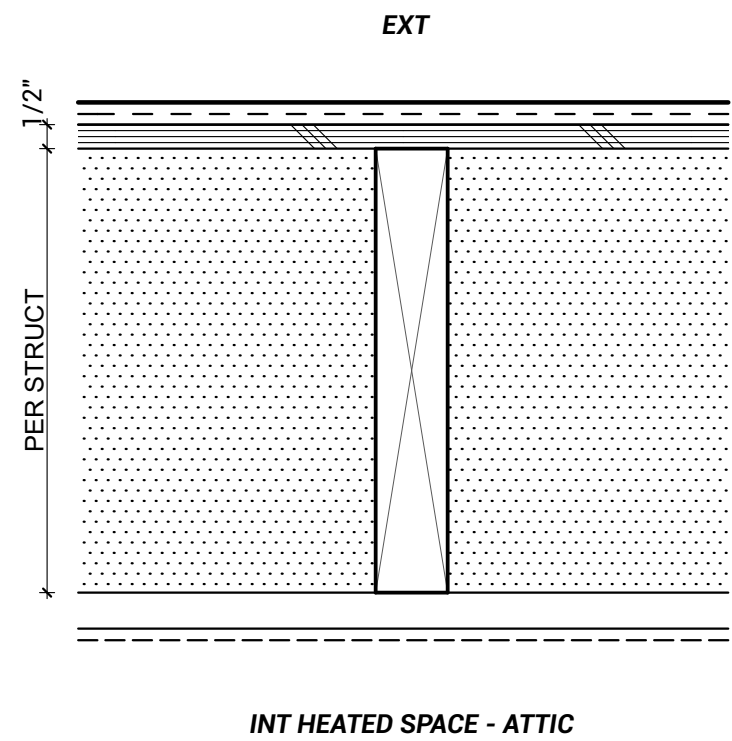
4 ROOF ASSEMBLY

- SHEET METAL ROOFING
- WATERPROOFING MEMBRANE
- 1/2" PLYWD SHTG (PER STRUCT)
- 2X WOOD JOISTS (PER STRUCT)
- SLOPE PER PLAN



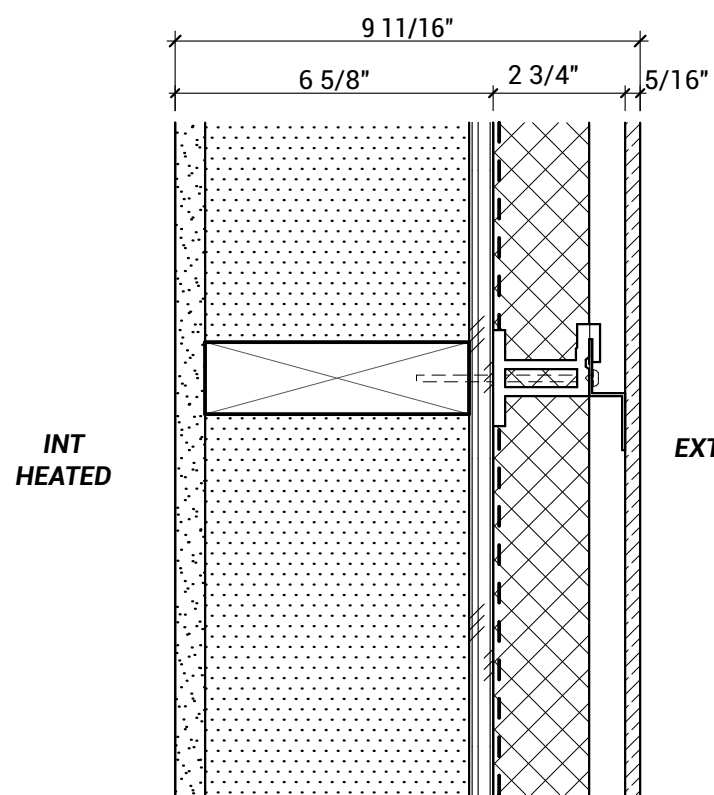
Y1 WOOD STUD WALL W/ PANEL RAINSCREEN

- 5/16" FIBER-CEMENT PANEL OR METAL CLADDING
- WD FURRING/VENTED AIR SPACE
- WRB - (AIR BARRIER)
- 1/2" PLYWD
- 2X6 WD STUDS @ 16" OC
- 1/2" PLYWD
- WRB - (AIR BARRIER)
- WD FURRING/VENTED AIR SPACE
- 5/16" FIBER-CEMENT PANEL OR METAL CLADDING



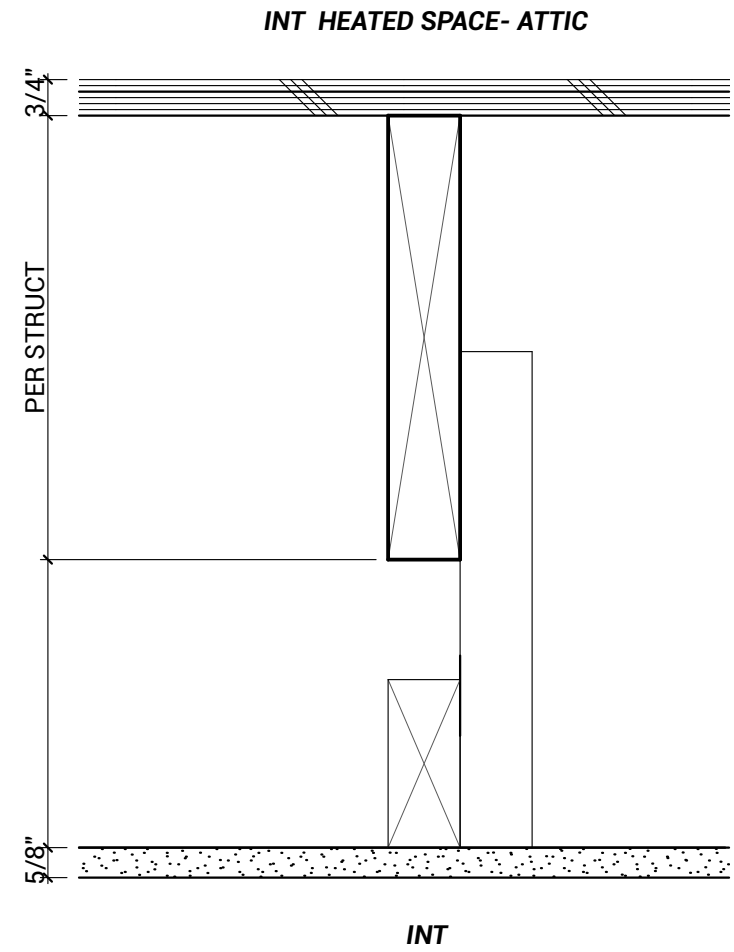
ROOF ASSEMBLY/TOP OF TRUSS - R-49 MIN

- SHEET METAL ROOFING
- WATERPROOFING MEMBRANE
- 1/2" PLYWD SHTG (PER STRUCT)
- HIGH DENSITY BLOW IN CELLULOSE
- 2X WOOD TRUSS (PER STRUCT)
- SLOPE PER PLAN
- 3/4" BATTEN
- SMART VAPOR BARRIER



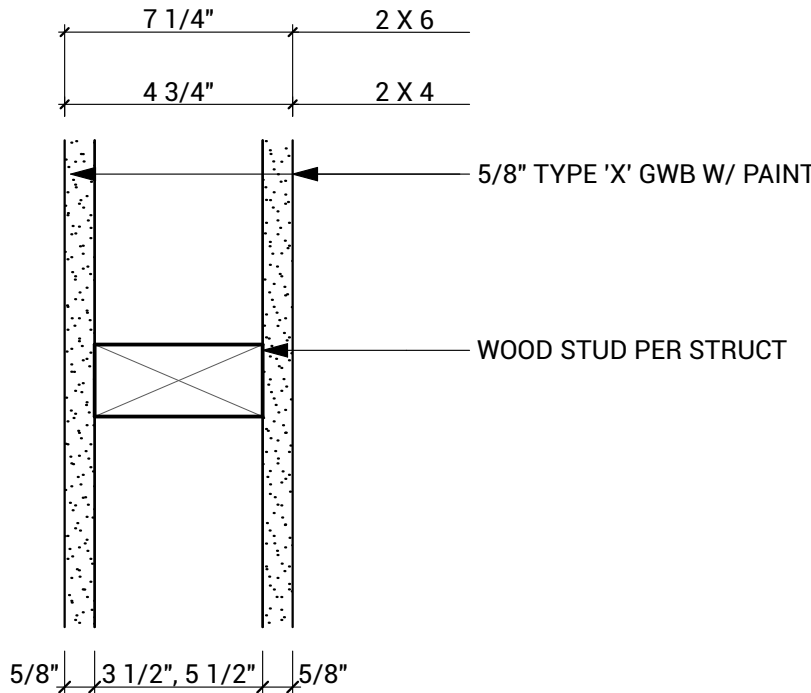
Z1 WOOD STUD WALL W/ PANEL RAINSCREEN - R-29 MIN

- 5/16" FIBER-CEMENT PANEL OR METAL CLADDING
- 3/4" VENTED AIR SPACE
- FURRING CLIP/PT WD FURRING
- 2" ROCK WOOL INSULATION
- WRB - (AIR BARRIER)
- 1/2" PLYWD
- 2X6 WD STUDS @ 16" OC
- HIGH DENSITY CELLULOSE INSULATION
- 5/8" GWB W/ VAPOR RETARDER PAINT



2 BOTTOM OF TRUSS W/ DROPPED CEILING

- 3/4" PLYWD
- 2X WOOD TRUSS (PER STRUCT)
- 2X DROPPED CEILING HANGERS
- 5/8" GWB



B TYP. INTERIOR WOOD STUD WALL - 2 x 6 STUD

A TYP. INTERIOR WOOD STUD WALL - 2 x 4 STUD

GENERAL NOTES

1. GYP BD IS 5/8" U.N.O.
2. CEMENTITIOUS BACKER IS 5/8"
3. STUD SIZES ARE PER PARTITION TYPE
4. WHERE ENDS OF PARTITION ABUT OTHER CONSTRUCTION PROVIDE RELIEF JOINT
5. SHEAR WALLS PER STRUCTURAL SCHEDULE
6. ALL EXPOSED GYP BOARD TO BE LEVEL 4 FINISH U.N.O.

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DESIGN AHOUSE

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SHEET TITLE
ASSEMBLIES

SHEET

SCALE

A800

AS INDICATED