

L'ADU.

A privacy-focused, introspective, energy-efficient, and all-electric ADU for the town of Kingston

RFP # K23-15 | Category: Professionals

DEMO Architecture PLLC

Alessandro Ronfini, AIA

Daniel Kidd, AIA

Catalina Rivera

Taylor Lowery

And pricing help from:

Seamus McCance - Seamus Build, LLC

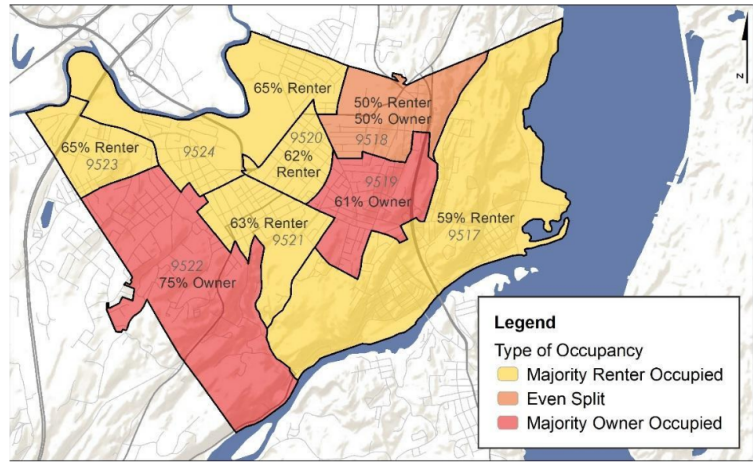
Marc Crudele - Guardian Structural Technologies

A Self-Sufficient and Self-Contained Design

Kingston's housing stock is equally distributed between renter-occupied households (53%) and owner-occupied households (47%)¹

The success of the ADU program is mainly dependent upon convincing owners to install a new structure in their backyard without disrupting their habits or reducing the value of their rental properties.

How to design an ADU attractive for owners and renters?



Source: U.S. Census Bureau - 2018 American Community Survey

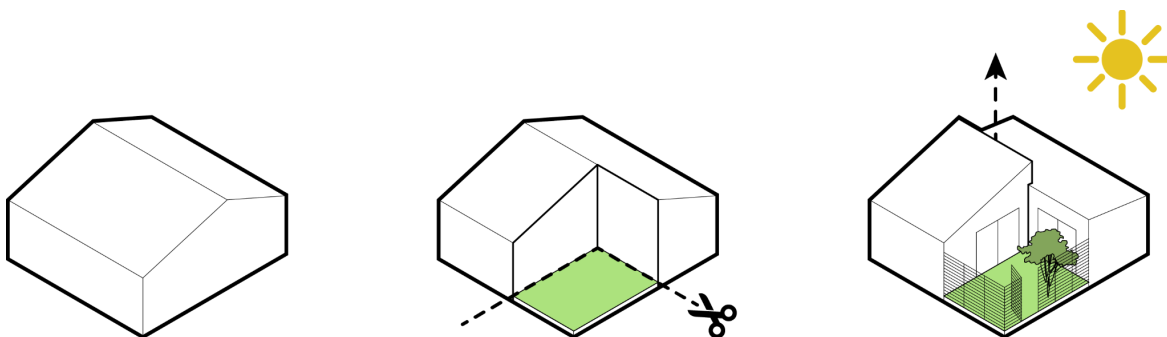
A recent study² on the public reaction to the ADU regulations proposed for the city of Sacramento offers some light on what owners and renters alike might fear. When questioned about why they would not want an ADU, homeowners put privacy and neighbors' concerns immediately after the inevitable logistical issues.

We asked ourselves how to design a building that would not revolutionize the relationship of owners and renters with their backyards and the privacy of their spaces.

We developed an inward-looking ADU wrapped around a private patio with a few clerestory windows on its sides and back.

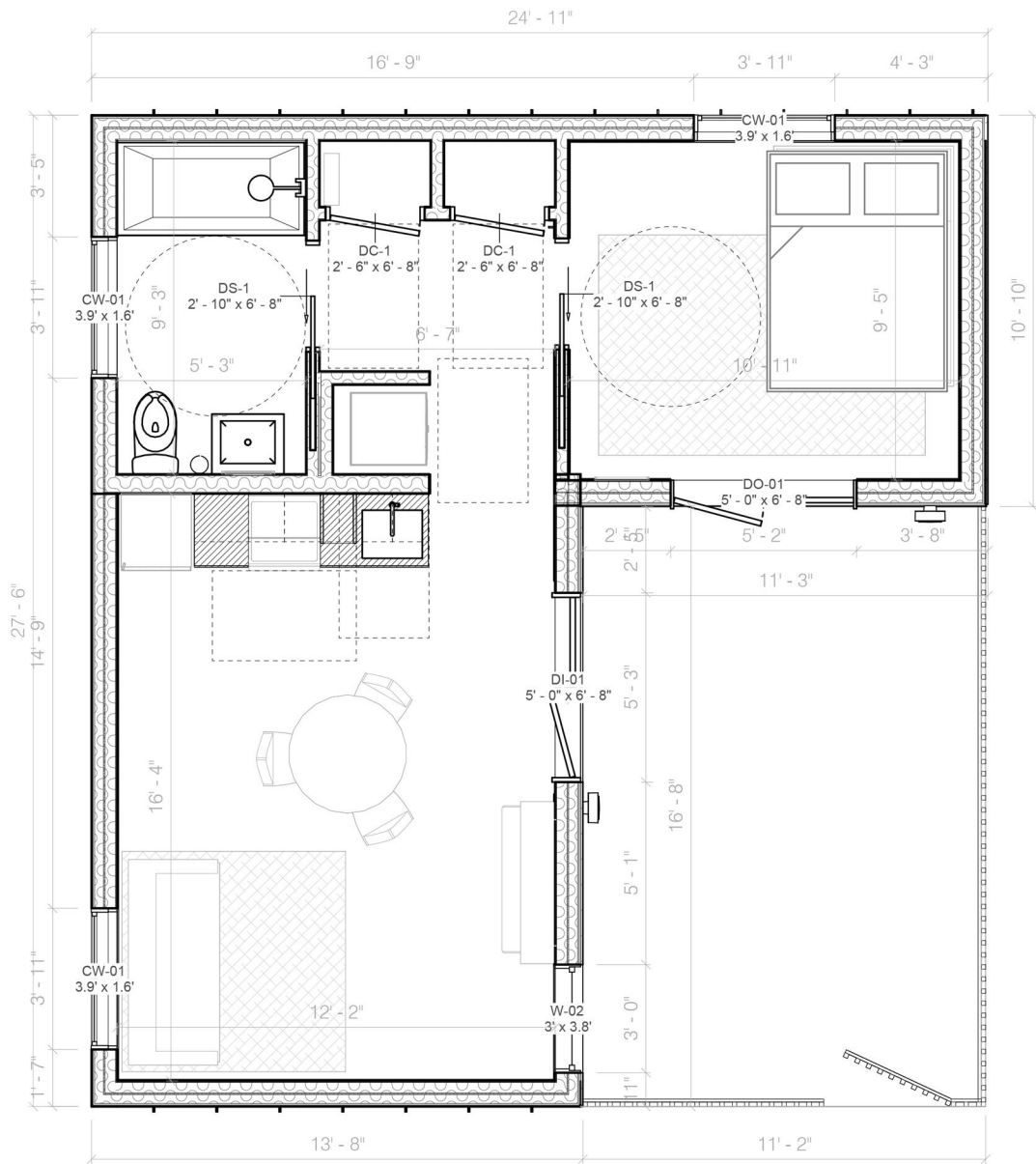
The roof is broken into two asymmetrical gables, allowing the installation of solar panels on the steeper slope and opening more clerestory windows lighting up the living room.

The result is a building that defines its interior and exterior space without disturbing the building owners' private yards and habits.



¹ Hudson Valley Pattern for Progress (2020) A plan for redevelopment: The City of Kingston's Vacant and Abandoned Properties.

² Jamey M. B. Volker & Susan Handy (2023) Exploring Homeowners' Openness to Building Accessory Dwelling Units in the Sacramento Metropolitan Area, Journal of the American Planning Association, 89:1, 45-60



L'ADU: Dimension plan



L'ADU: Exploded Axonometric View

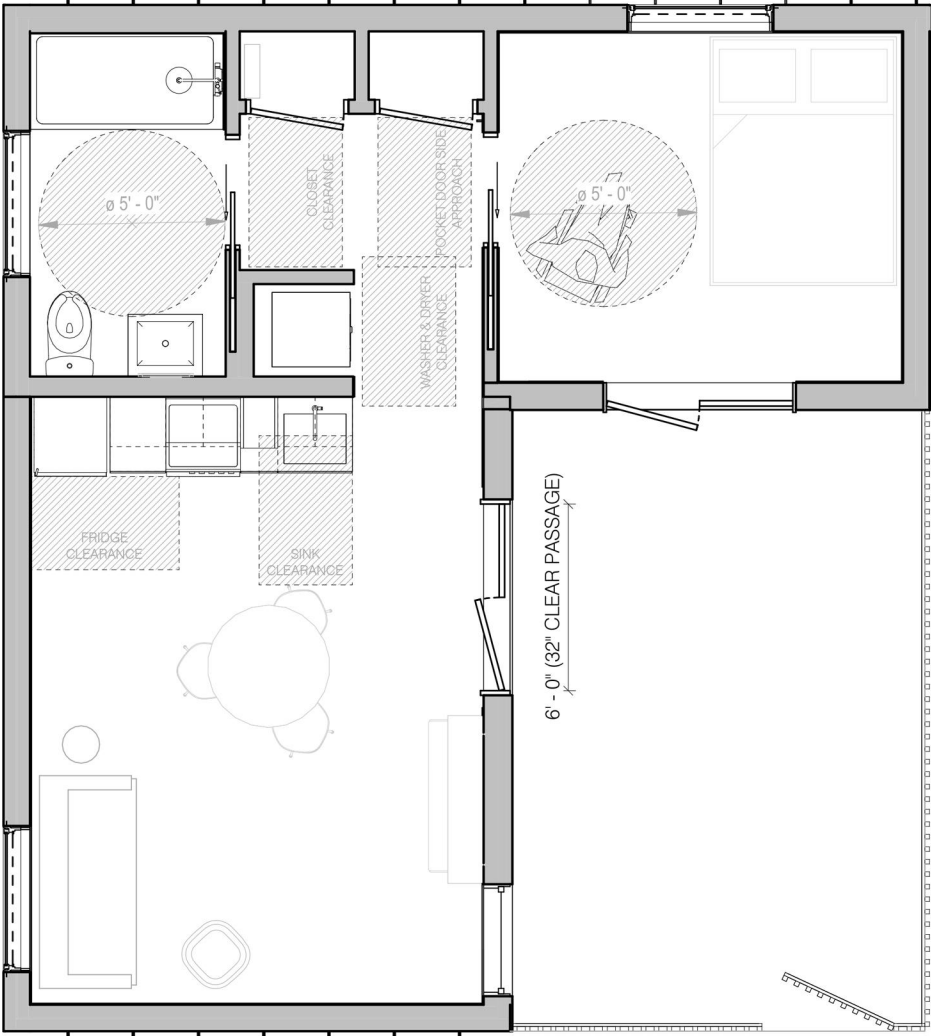
L'ADU: View From the Bedroom

L'ADU: View From the Yard



Accessibility

We designed every space with accessibility in mind. The linear kitchen has plenty of room for maneuvering. Bathrooms, corridors, and doors all meet the minimum ADA requirements for circulation. The washer, dryer, and closet are also located so that this small dwelling meets accessibility requirements despite its small footprint.



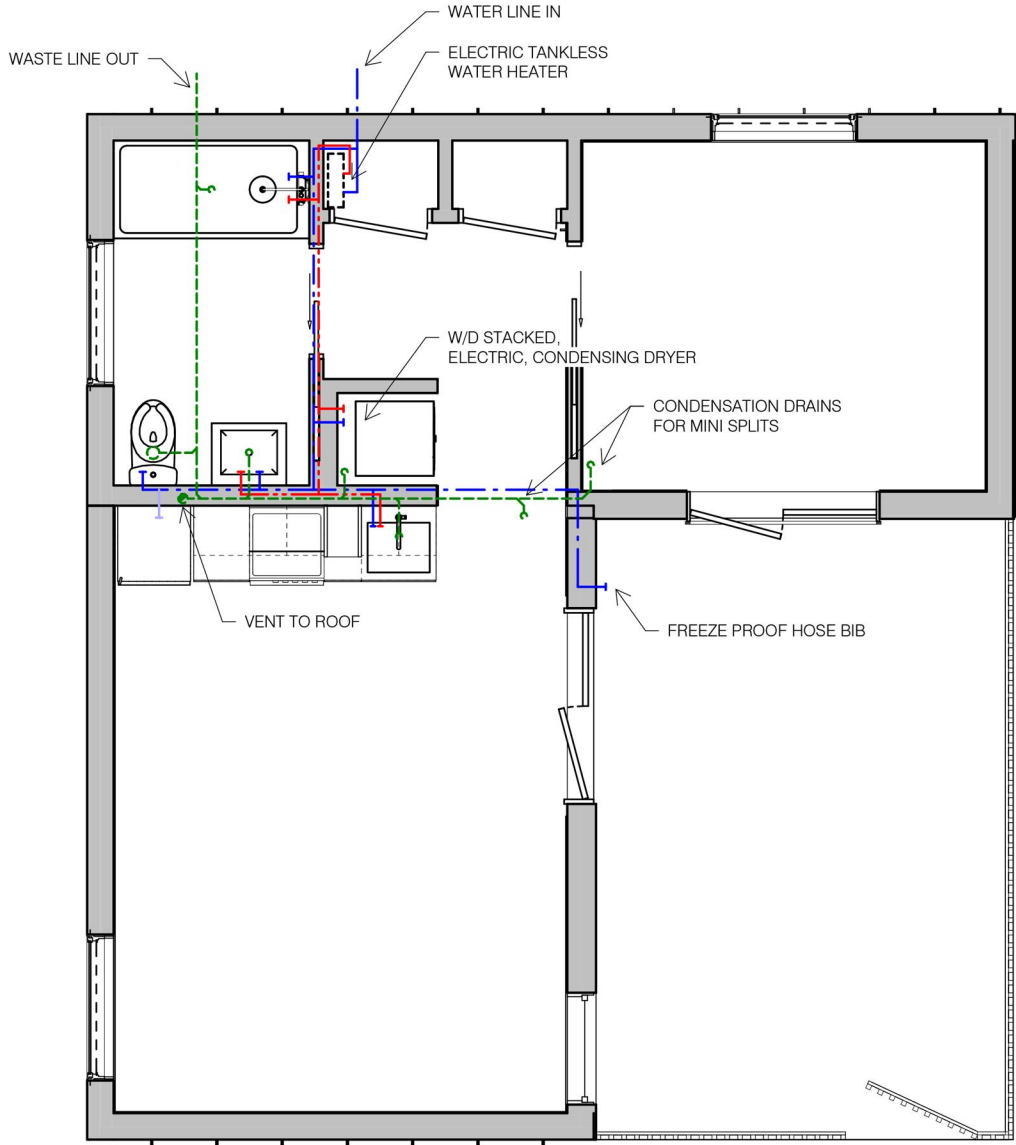
L'ADU: Accessibility Plan

Sustainability and Resilience

We designed L'ADU as an all-electric building that optimizes and minimizes mechanical systems and meets the Energy Star and Indoor AirPLUS requirements.

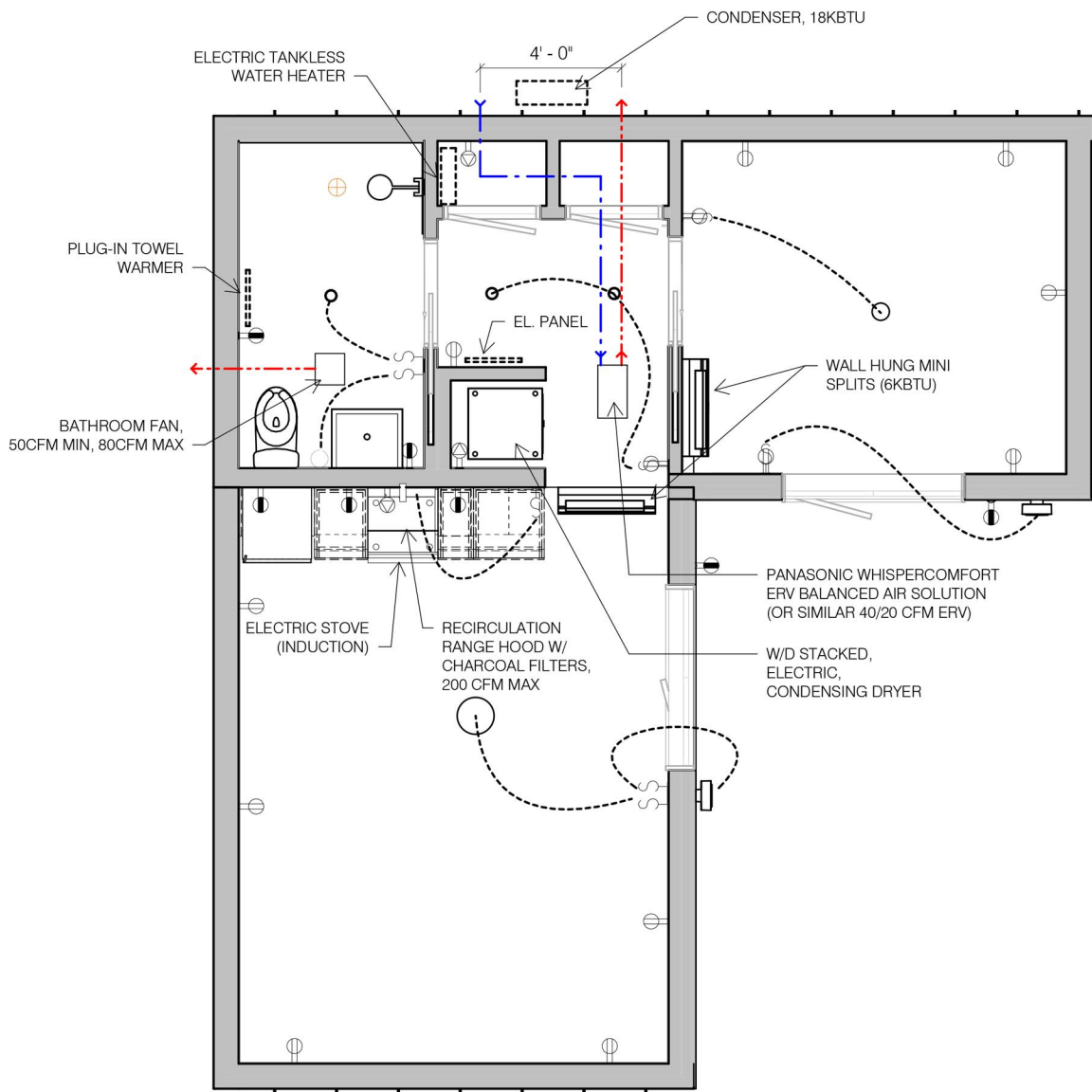


The kitchen backs against the bathroom and W/D closet, minimizing pipes run and wasted heat. Only one waste line runs below grade, and only one vent perforates the roof. A wall-mounted tankless electric heater provides domestic hot water. While more expensive than a traditional tank heater, this system uses considerably less space and, for homes that use 41 gallons or less of hot water daily, can be 24%-34% more efficient than conventional systems³.

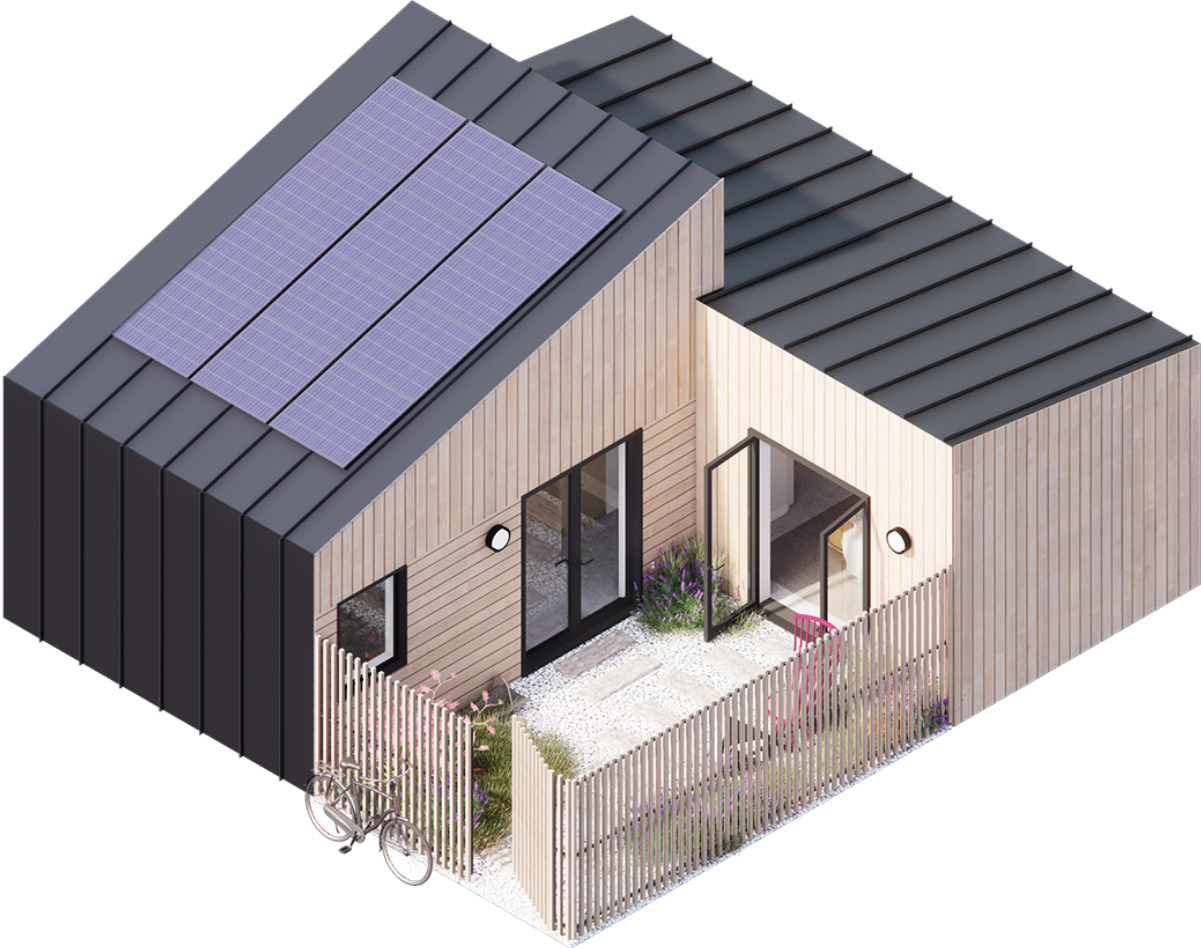


³ <https://www.energy.gov/energysaver/tankless-or-demand-type-water-heaters>

The building is heated and cooled by two 6kBTU ductless heat pumps. The bathroom will have a wall-mounted, plug-in electric towel warmer for freezing days. The envelope is detailed to meet and surpass the 0.4 cfm/sqft @75Pa leakage rate indicated in the code and, with the proper craft, meet the Passive House rate (0.04 cfm/sqft). We installed a ceiling-mounted whole-house ERV to maintain air quality and reduce conditioning costs. The bathroom has a user-activated fan to remove stale, humid air quickly. All equipment is readily available, Energy Star rated, and suitable for a small building.



L'ADU is solar-ready and could achieve Net-Zero by installing five 400W solar panels. The orientation and the shading will play a role in achieving this goal, and a professional should evaluate each instance.

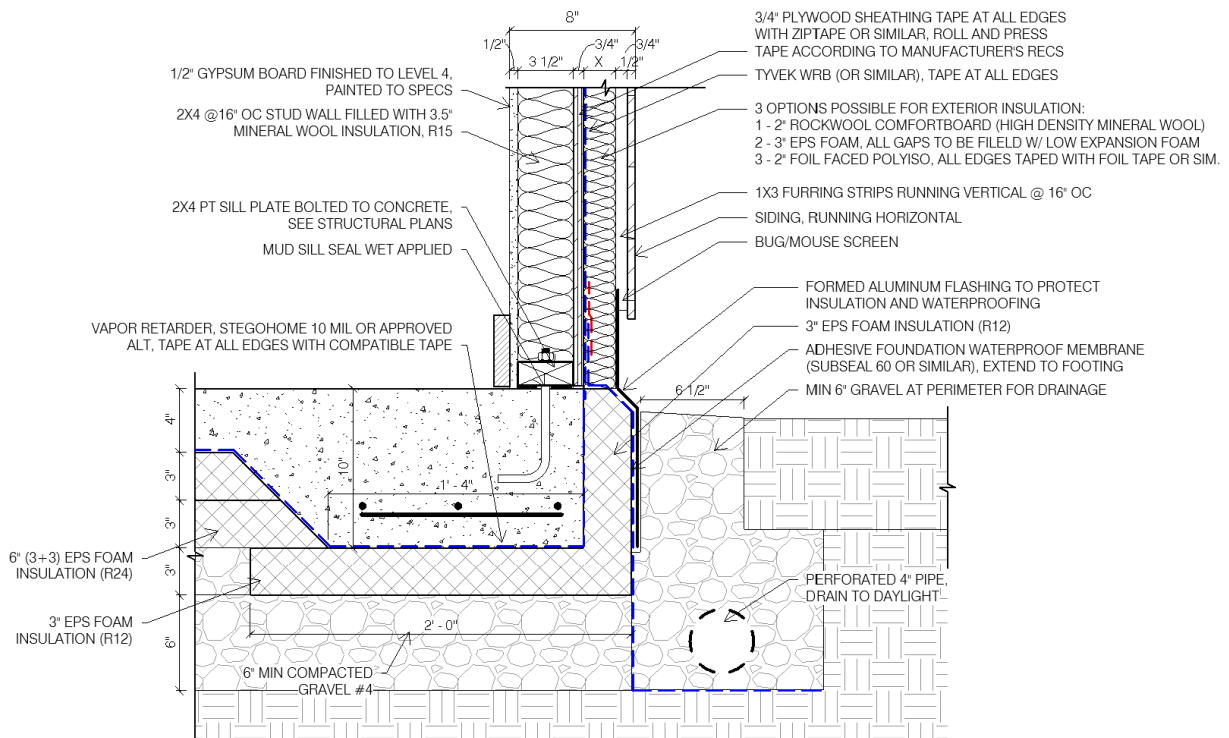


Affordability and Cost-Effectiveness

This building can achieve outstanding performance using best practices and available materials. Our envelope design reduces cost and makes the construction of L'ADU accessible to a vast pool of contractors and do-it-yourselfers.

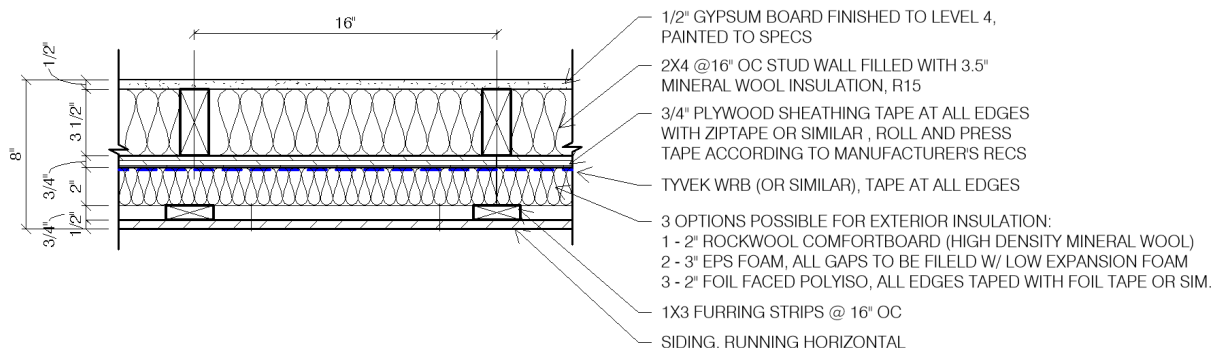
The building sits on a concrete slab-on-grade, the insulation acts as formwork, and lumber work is minimal. The concrete has a hand-trowel finish that will be exposed.

Owners can easily customize their ADUs by adding wood or synthetic floors directly above it.

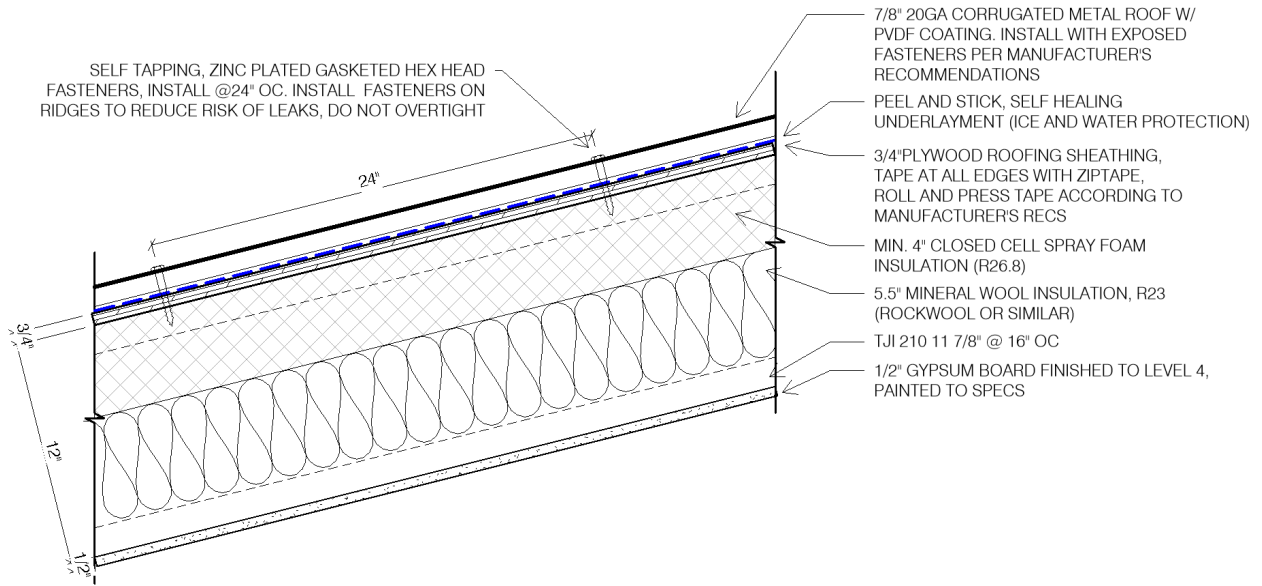


The walls are standard 2x4 @ 16" OC. Taping the plywood sheathing and then the WRB membrane guarantees air tightness.

Walls are insulated with mineral wool on the interior and a continuous insulation layer on the exterior. We offer three interchangeable materials for exterior insulation: all three allow the wall to breathe correctly and dry any humidity within the walls.



For the cathedral roof, we proposed TJIs, a thermal-bridge-free structure. A layer of closed-cell spray-foam insulation removes the risk of condensation. Mineral wool helps exceed the minimum code requirements.



Construction Cost

Traditional Stick-Built

The cost is based on a mix of historical data from recent projects, bids from subcontractors, and the price of readily available material.

The products linked are suggestions to prove the numbers are realistic; all products can be substituted as desired.

The Cost includes estimated permitting fees and the profit of the GC.



| | |
|-----------------------------------|------------------|
| Total cost of construction | \$139,465 |
| Stick built framing | |

| | |
|------------------------------------------|-----------------|
| Division 01 – General Requirement | \$19,120 |
|------------------------------------------|-----------------|

| | | |
|-----------------------|----------|----------------------------------------------------------------------------------------------------------|
| Pre-Construction | \$800 | Permits and coordination with Town |
| Dumpster + Toilet | \$2,000 | material- dumpster (estimated 3 months construction) |
| GC fees and insurance | \$16,320 | Estimated at 15% of construction costs with the exclusions of Fixtures and Equipment (provided by owner) |

| | |
|---------------------------------|----------------|
| Division 02 – Site Works | \$6,500 |
|---------------------------------|----------------|

| | | |
|------------------------------------|---------|------------------------------------------|
| Foundations excavation | \$4,500 | Excavation work slab, utilities, grading |
| Electrical and plumbing excavation | \$2,000 | Connection to existing utilities |

| | |
|-------------------------------|----------------|
| Division 03 – Concrete | \$4,600 |
|-------------------------------|----------------|

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|-------------|---------|------------------------------------------------------|
| Foundations | \$4,600 | Slab on grade with haunch, rebar, hand trowel finish |
|-------------|---------|------------------------------------------------------|

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|-----------------------------|----------------|
| Division 05 – Metals | \$8,300 |
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| | | |
|---------|---------|---------------------------------------------|
| Roofing | \$8,300 | Clip-on standing seam metal roof, installed |
|---------|---------|---------------------------------------------|

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|----------------------------------------|-----------------|
| Division 06 – Wood and Plastics | \$20,100 |
|----------------------------------------|-----------------|

| | | |
|---------|----------|--------------------------------------------|
| Framing | \$8,000 | material- |
| Framing | \$10,000 | labor- |
| Patio | \$2,100 | material & labor- fence approx \$75 a foot |

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|------------------------------------------------------|-----------------|
| Division 07 – Thermal and Moisture Protection | \$16,100 |
|------------------------------------------------------|-----------------|

| | | | |
|--------------------|---------|------------------------------------------------------|----------------------|
| Insulation - Walls | \$1,600 | material- Mineral wool (interior of perimeter walls) | LINK |
| Insulation - Walls | \$4,000 | material - Polyiso insulation (exterior walls) | LINK |
| Insulation - Roof | \$1,200 | Material - mineral wool (roof) | LINK |
| Insulation - Roof | \$2,800 | material and labor closed cell spray foam (roof) | |
| Insulation- Labor | \$4,500 | labor- | |
| WRB installation | \$2,000 | Material and labor | |

| | |
|----------------------------------------|-----------------|
| Division 08 – Doors and Windows | \$10,768 |
|----------------------------------------|-----------------|

| | | | |
|--------------------------|---------|-------------------------------------------------------------|----------------------|
| Exterior door (material) | \$2,256 | (1x) Jeld Wen (or similar) Fiberglass Inswing door 72x80 | LINK |
| Exterior door (material) | \$2,090 | (1x) Jeld Wen (or similar) Fiberglass Outswing door 60x80 | LINK |
| Window (material) | \$1,108 | (1x) Jeld Wen (or similar) vinyl Casement 36x48 | LINK |
| Window (material) | \$1,524 | (3x) Jeld Wen (or similar) vinyl Awning 36x18 (\$508/each) | LINK |
| Window (material) | \$590 | (2x) Jeld Wen (or similar) vinyl Picture 36x18 (\$295/each) | LINK |
| Doors (material) | \$2,000 | interior doors - 2 swing, 2 pocket @ \$500 each | |

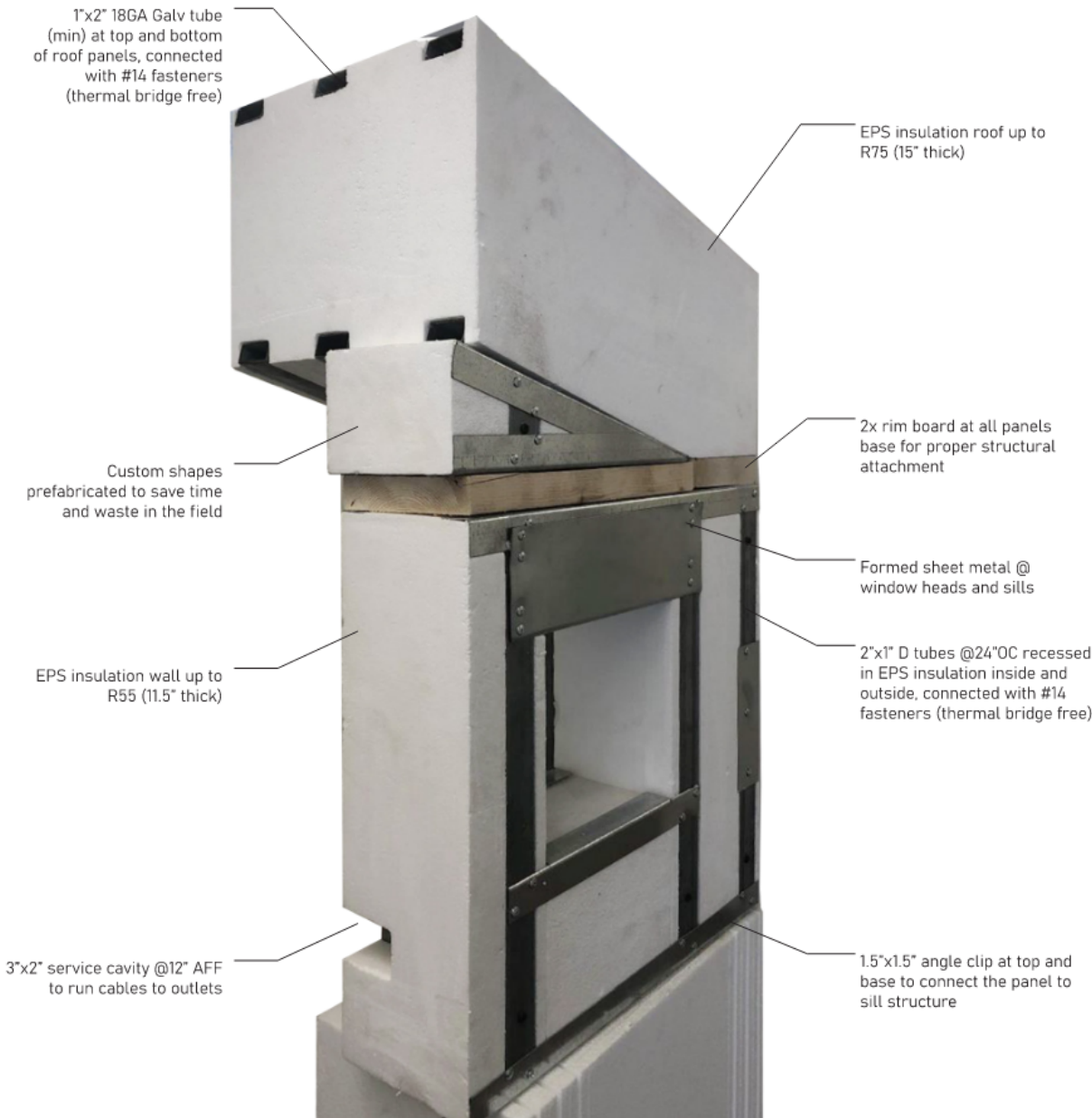
| | | |
|------------------------------------------|----------------------------------------------------------------------------|----------------------|
| Windows & Doors | \$1,200 labor- install exterior and interior | |
| Division 09 – Finishes | | \$23,600 |
| Drywall | \$1,000 material- | |
| Drywall | \$2,500 labor- | |
| Painting | \$2,500 subcontractor- | |
| Siding | \$7,600 material-approx \$8 sq/ft | |
| Siding | \$7,600 labor- siding approx \$8 sq/ft | |
| Trim | \$700 material and labor approx \$5 sq/ft | |
| Tiling - Shower | \$500 Tiles \$5/sqft (Daltile or similar) + Grout and misc. | |
| Tiling | \$1,200 Labor | |
| Division 11 – Equipment | | \$5,338 |
| Kitchen | \$598 Frigidaire 11.6 cu. Ft. 24" wide | LINK |
| Kitchen | \$1,195 Frigidaire Induction Range or similar | LINK |
| Kitchen | \$599 Microwave with recirculating fan | LINK |
| Washer and Dryer | \$2,290 LG 24" Stacked Washer and Condensing Dryer | LINK |
| Tankless Water heater | \$656 Stiebel Eltron Tempra 20 Plus or similar tankless electric | LINK |
| Division 12 – Furnishings | | \$6,204 |
| Kitchen - cabinets | \$798 Ikea Enhet cabinets and doors (includes upper cabinets and hardware) | LINK |
| Kitchen - cabinets Installation | \$1,760 Labor, 2 laborers, 2 days | |
| Kitchen - Faucet | \$129 Ikea Almaren Faucet or similar | LINK |
| Kitchen - Sink | \$149 Ikea Havsens sink or similar | LINK |
| Kitchen - Countertop | \$1,500 labor and material- butcher block | |
| Bathroom - Faucet | \$226 Kohler tempered or similar | LINK |
| Bathroom - Vanity | \$299 Glacier Bay Everdean vanity w/ sink, 24" | LINK |
| Bathroom - Tub | \$596 Duravit 60" skirt alcove bathtub or sim | LINK |
| Bathroom - Toilet | \$334 Duravit 219601 Elongated toilet or sim | LINK |
| Bathroom - Tub and Shower system | \$233 Kohler tempered or similar | LINK |
| Bathroom - Towel warmer | \$180 Anzzi 4 bar or similar | LINK |
| Division 15 – Mechanical/Plumbing | | \$12,835 |
| Plumbing | \$3,500 Rough in and trim out | |
| HVAC installation | \$6,000 Heat pump. 2x wall-hung mini splits + condenser | |
| HVAC equipment | \$2,758 Mitsubishi (or similar) 6+6kBTU + 18kBTU condenser | LINK |
| Bathroom fan | \$98 Panasonic WhisperRemodel or similar | LINK |
| ERV | \$479 Panasonic WhisperComfort or similar | LINK |
| Division 16 – Electrical | | \$6,000 |
| Electrical | \$4,000 Rrough in and trim out | |
| Lighting fixtures | \$2,000 Accent lighting fixtures allowance | |

Construction Cost

GST Panelized Construction

We considered alternative pricing using a panelized system from Guardian Structural Systems (GST). This is a proprietary system: we do not recommend using this manufacturer over a different company. Still, we think there can be an economic benefit in using panels to streamline construction and improve the performance of L'ADU.

GST's panels are composed of EPS foam sandwiched between steel studs. The system is thermal-bridge free, economical, and lightweight. It can be installed rapidly by a small crew without specialty equipment.



| | |
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| Total cost of construction | \$130,944 |
| GST Panelized construction | |

| | |
|------------------------------------------|-----------------|
| Division 01 – General Requirement | \$18,009 |
|------------------------------------------|-----------------|

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|-----------------------|----------|----------------------------------------------------------------------------------------------------------|
| Pre-Construction | \$800 | Permits and coordination with Town |
| Dumpster + Toilet | \$2,000 | material- dumpster (estimated 3 months construction) |
| GC fees and insurance | \$15,209 | Estimated at 15% of construction costs with the exclusions of Fixtures and Equipment (provided by owner) |

| | |
|---------------------------------|----------------|
| Division 02 – Site Works | \$6,500 |
|---------------------------------|----------------|

| | | |
|------------------------------------|---------|------------------------------------------|
| Foundations excavation | \$4,500 | Excavation work slab, utilities, grading |
| Electrical and plumbing excavation | \$2,000 | Connection to existing utilities |

| | |
|-------------------------------|----------------|
| Division 03 – Concrete | \$4,600 |
|-------------------------------|----------------|

| | | |
|-------------|---------|------------------------------------------------------|
| Foundations | \$4,600 | Slab on grade with haunch, rebar, hand trowel finish |
|-------------|---------|------------------------------------------------------|

| | |
|-----------------------------|----------------|
| Division 05 – Metals | \$8,300 |
|-----------------------------|----------------|

| | | |
|---------|---------|---------------------------------------------|
| Roofing | \$8,300 | Clip-on standing seam metal roof, installed |
|---------|---------|---------------------------------------------|

| | |
|----------------------------------------|----------------|
| Division 06 – Wood and Plastics | \$5,300 |
|----------------------------------------|----------------|

| | | |
|-------------------------|---------|--------------------------------------------|
| Framing (interior only) | \$1,200 | material- |
| Framing | \$2,000 | labor- |
| Patio | \$2,100 | material & labor- fence approx \$75 a foot |

| | |
|------------------------------------------------------|----------------|
| Division 07 – Thermal and Moisture Protection | \$2,000 |
|------------------------------------------------------|----------------|

| | | |
|------------------|---------|--------------------|
| WRB installation | \$2,000 | Material and labor |
|------------------|---------|--------------------|

| | |
|----------------------------------------|-----------------|
| Division 08 – Doors and Windows | \$10,768 |
|----------------------------------------|-----------------|

| | | | |
|--------------------------|---------|-------------------------------------------------------------|----------------------|
| Exterior door (material) | \$2,256 | (1x) Jeld Wen (or similar) Fiberglass Inswing door 72x80 | LINK |
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| Window (material) | \$1,524 | (3x) Jeld Wen (or similar) vinyl Awning 36x18 (\$508/each) | LINK |
| Window (material) | \$590 | (2x) Jeld Wen (or similar) vinyl Picture 36x18 (\$295/each) | LINK |
| Windows & Doors | \$2,000 | material- interior doors - 2 swing, 2 pocket @ \$500 each | |
| Windows & Doors | \$1,200 | labor- install exterior and interior | |

| | |
|-------------------------------|-----------------|
| Division 09 – Finishes | \$23,600 |
|-------------------------------|-----------------|

| | | |
|---------|---------|-----------|
| Drywall | \$1,000 | material- |
| Drywall | \$2,500 | labor- |

| | |
|-----------------|-------------------------------------------------------------|
| Painting | \$2,500 subcontractor- |
| Siding | \$7,600 material-approx \$8 sq/ft |
| Siding | \$7,600 labor- siding approx \$8 sq/ft |
| Trim | \$700 material and labor approx \$5 sq/ft |
| Tiling - Shower | \$500 Tiles \$5/sqft (Daltile or similar) + Grout and misc. |
| Tiling | \$1,200 Labor |

Division 10 – Specialties **\$21,490**

| | | |
|-----------------------|-------------------------------------------|----------------------|
| Panels | \$16,220 Panelized system by GST | LINK |
| Panels - Shipping | \$1,750 40' hot shot trailer delivery | |
| Panels - Installation | \$3,520 3 days, 4 laborers, misc material | |

Division 11 – Equipment **\$5,338**

| | | |
|-----------------------|------------------------------------------------------------------|----------------------|
| Kitchen | \$598 Frigidaire 11.6 cu. ft. 24" wide | LINK |
| Kitchen | \$1,195 Frigidaire Induction Range or similar | LINK |
| Kitchen | \$599 Microwave with recirculating fan | LINK |
| Washer and Dryer | \$2,290 LG 24" Stacked Washer and Condensing Dryer | LINK |
| Tankless Water heater | \$656 Stiebel Eltron Tempra 20 Plus or similar tankless electric | LINK |

Division 12 – Furnishings **\$6,204**

| | | |
|----------------------------------|----------------------------------------------------------------------------|----------------------|
| Kitchen - cabinets | \$798 Ikea Enhet cabinets and doors (includes upper cabinets and hardware) | LINK |
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| Kitchen - Faucet | \$129 Ikea Almaren Faucet or similar | LINK |
| Kitchen - Sink | \$149 Ikea Havsens sink or similar | LINK |
| Kitchen - Countertop | \$1,500 labor and material- countertops (butcher block) | |
| Bathroom - Faucet | \$226 Kohler tempered or similar | LINK |
| Bathroom - Vanity | \$299 Glacier Bay Everdean vanity w/ sink, 24" | LINK |
| Bathroom - Tub | \$596 Duravit 60" skirt alcove bathtub or sim | LINK |
| Bathroom - Toilet | \$334 Duravit 219601 Elongated toilet or sim | LINK |
| Bathroom - Tub and Shower system | \$233 Kohler tempered or similar | LINK |
| Bathroom - Towel warmer | \$180 Anzzi 4 bar or similar | LINK |

Division 15 – Mechanical/Plumbing **\$12,835**

| | | |
|-------------------|---------------------------------------------------------|----------------------|
| Plumbing | \$3,500 Rough in and trim out | |
| HVAC installation | \$6,000 Heat pump. 2x wall hung mini splits + condenser | |
| HVAC equipment | \$2,758 Mitsubishi (or sim) 6+6kBTU + 18kBTU condenser | LINK |
| Bathroom fan | \$98 Panasonic WhisperRemodel or similar | LINK |
| ERV | \$479 Panasonic WhisperComfort or similar | LINK |

Division 16 – Electrical **\$6,000**

| | |
|-------------------|--------------------------------------------|
| Electrical | \$4,000 Rough in and trim out |
| Lighting fixtures | \$2,000 Accent lighting fixtures allowance |

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