2. Project Description

TempePOD is a compact, high-performance accessory dwelling unit designed for rapid construction and long-term durability. At just 276 square feet, the mono-space layout integrates living, sleeping, kitchen, and bathroom functions within a highly efficient footprint, supported by a 12'x40' hollow-core plank foundation. Structural Insulated Panels (SIPs) provide exceptional thermal performance, airtightness, and sound attenuation, maximizing comfort and minimizing energy use. All fixed elements—storage, kitchen, and bath—are integrated into a continuous built-in casework, creating a cohesive interior. The modular design can adapt to varying lot conditions, function as detached or attached, and expand with additional modules as needs evolve. Prefabrication and off-site construction reduce labor costs, site disruption, and build time. With a small environmental footprint, minimal site disturbance, and flexible configurations, the TempePOD addresses Tempe's goals for increasing affordable housing, supporting aging-in-place, and enhancing neighborhood livability through thoughtful, space-efficient design.

3. Design Concept & Goals

The TempePOD is conceived as a small-footprint, prefabricated accessory dwelling unit that delivers affordability, adaptability, and exceptional performance. Designed specifically for compact lots and diverse site conditions, the 276-square-foot base model consolidates all primary functions—living, sleeping, cooking, and bathing—into a mono-space configuration. This efficiency is achieved through a continuous built-in casework wall that integrates storage, appliances, and utilities, creating a streamlined, uncluttered interior. The result is a dwelling that feels larger than its footprint, meets essential living needs, and supports multigenerational or rental housing opportunities.

Small Footprint Innovation

At under 600 square feet, the TempePOD meets the requirements for Tempe's Small Footprint ADU category while offering scalability. Homeowners can select from multiple module arrangements—studio, one-bedroom, ADA-accessible layouts, or expanded two-bedroom options—based on lot size, privacy needs, and budget. The smallest configuration functions as an independent unit or can be combined with other modules for larger living spaces, enabling phased expansion without redundant construction.

Construction Approach

The design prioritizes speed, precision, and reduced site disruption. Fabricated off-site, the primary structure arrives as a prefinished module mounted on a 12'x40' hollow-core plank foundation. On-site work is limited to preparing precast foundation blocks, utility connections, and final assembly. This approach minimizes construction time, labor costs, and neighborhood disruption, making it attractive for infill lots and homeowner-led projects.

Material & Structural Systems

Structural Insulated Panels (SIPs) form the building envelope, offering exceptional R-values, airtightness, and reduced thermal bridging. SIP walls maximize usable floor space by minimizing wall thickness while maintaining high insulation performance. The panels also provide enhanced sound attenuation—critical in dense neighborhoods—and resist wind, moisture, and pests. Hollow-core concrete planks serve as both the foundation platform and finished subfloor, integrating durability with thermal mass benefits.

Sustainability & Energy Efficiency

The TempePOD aligns with Tempe's sustainability goals by reducing operational energy use and environmental impact. Key features include:

- High-Performance Envelope: SIP construction significantly reduces heating and cooling loads, lowering energy bills and enhancing comfort.
- Passive Design: Glazing is strategically minimized on east and west facades to reduce heat gain, with optional canopies for additional shading.
- Solar Integration: Roof surfaces are PV-ready, enabling homeowners to take advantage of federal solar tax credits.
- Water Efficiency: Low-flow fixtures, drought-tolerant landscaping, and optional rainwater harvesting reduce potable water demand.
- Material Durability: Acetylated wood cladding and ventilated rain-screen assemblies extend building life and minimize maintenance.

Accessibility & Flexibility

The base unit is designed with clear circulation paths, a no-step entry, and adaptable layouts that can meet ADA requirements. This flexibility supports aging-in-place, multigenerational households, and diverse tenant needs. Interior finishes, cabinetry, and fixtures can be customized for different user groups without altering the core structural or mechanical systems.

Context & Site Adaptability

The TempePOD is designed to integrate seamlessly into varied Tempe neighborhoods. Its simple rectangular form and adaptable façade treatments can complement both historic and contemporary contexts. The unit can be oriented to optimize privacy, daylighting, and solar gain, with entrances and windows placed to minimize impacts on adjacent residences.

Affordability & Homeowner Benefits

By combining prefabrication, efficient materials, and reduced construction timelines, the TempePOD keeps costs within reach for homeowners. Beyond providing additional living space, it offers potential rental income, supports extended family housing, and increases property value. The low-maintenance materials and high energy performance also reduce ongoing operating expenses.

Solution

The TempePOD demonstrates how a small-footprint ADU can deliver big benefits. Its modular adaptability, sustainable construction, and thoughtful design create a comfortable, flexible, and enduring housing solution. By aligning with Tempe's goals for affordable, high-quality, and context-sensitive development, it offers a replicable model for expanding the city's housing options while preserving neighborhood character.

4. Construction Cost Breakdown

Target build: 276 sf studio, SIP shell on hollow-core plank platform with rain-screen cladding, insulated glazing, compact kitchen & bath, high-efficiency heat pump, LED lighting

Division / Scope	What's Included	Est. Range
General Conditions & Mobilization	Setup, temp protection, small tools, waste, basic project mgmt (fast-set, prefabricated scope)	**$6,000 – $8,000**
Sitework (minimal)	Minor grading, pad prep, compacted base for precast blocks; trenching for short utility stubs to platform	**$3,500 – $5,500**
Foundation / Platform	**Precast foundation blocks + 12'×40' hollow-core plank** placement, shim/level, rigid insulation edge blocking, cap grouting as needed	**$12,000 – $15,000**
Primary Structure / Envelope	**SIP walls & roof**, splines/plates, sealants/air-barrier continuity; fasteners; weather barrier; airtight detailing (minimizes thermal bridging)	**$22,000 – $26,000**
Exterior Cladding & Roofing	**Ventilated rain-screen** assembly, **acetylated wood cladding**, flashings; concealed gutter; roof membrane and ridge detailing	**$9,000 – $12,000**
Windows / Doors / Daylight Panels	**Insulated glazing** package; exterior door set; selective **hollow-cell polycarbonate** daylight panel(s) where shown	**$5,500 – $7,500**
Interior Casework & Built-ins	One continuous **built-in casework wall** housing storage, kitchen, utilities chase; bath vanity & storage	**$7,000 – $9,500**
Interior Finishes	LVT or similar resilient floor, gypsum board & paint, bath tile/wet-wall surfaces, trims	**$4,500 – $6,000**
Plumbing (inside unit)	Rough-in + trim: compact bath (toilet, shower, lav), kitchen sink, WH; connection up to platform stub	**$4,500 – $6,000**
Mechanical (inside unit)	**High-efficiency heat pump** (mini-split/VRF-style) with line-sets, condensate, controls	**$4,500 – $6,000**
Electrical (inside unit)	Panel in unit or sub-panel, branch circuits, code lighting/receps, **LED fixtures**, bath fan, range hood	**$3,500 – $4,500**
Appliances (allowance)	ENERGY STAR: compact fridge, induction or cooktop, combo W/D (or hookups)	**$2,500 – $3,500**

Hard-Cost Subtotal: $85,000 – $92,000

Owner/Soft & Variable (Outside the Box)

These are site/owner items you already identified as ranges; they sit on top of hard costs and fluctuate by lot conditions and utility runs:

- Delivery / set of prefab components or module: $2,000 – $5,000
- Permits & fees (building, trade, impact as applicable): $2,000 – $6,000
- Site preparation (beyond minimal above: demo, trees, fencing, access fixes): $2,000 – $5,000
- Utility connections from house/service to ADU platform (distance/upsizing sensitive): $3,000 – $5,000
- Plan Price = $5,000
- Customization and Plan modifications $125 hr.

Owner/Soft Subtotal: $15,000 – $25,000

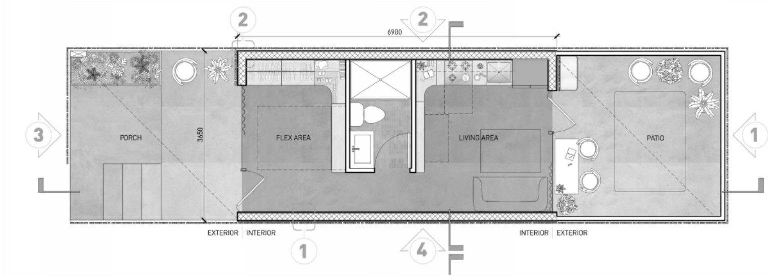
Optional Adds (Priced Separately)

- **PV-ready or PV installed** (small array, inverter, interconnect): **$8,000 – $12,000** (prices vary; 30% federal credit noted)
- **Rainwater/condensate harvesting** (tank + gutters + first-flush): **$1,500 – $3,000**
- **Accessibility upgrades** (clearances, roll-in shower, grab blocking, lowered worktops): **$3,000 – $6,000** (if not using the full ADA layout)
- **Privacy fencing / screens / landscape** (xeric palette): **$2,000 – $6,000**

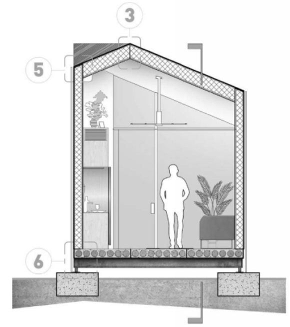
TOTAL COST

$100,000 – $135,000 ($362 sf - $490 sf)

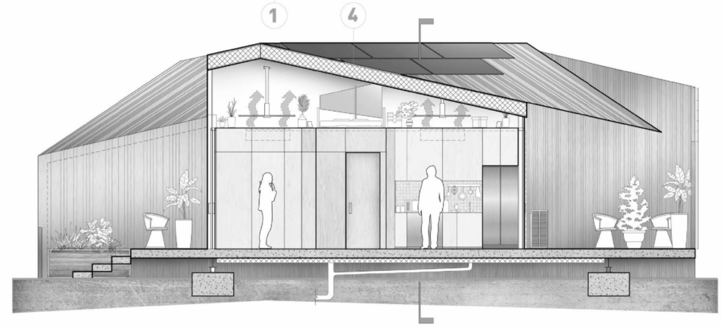
FLOOR PLAN 1/4"=1'



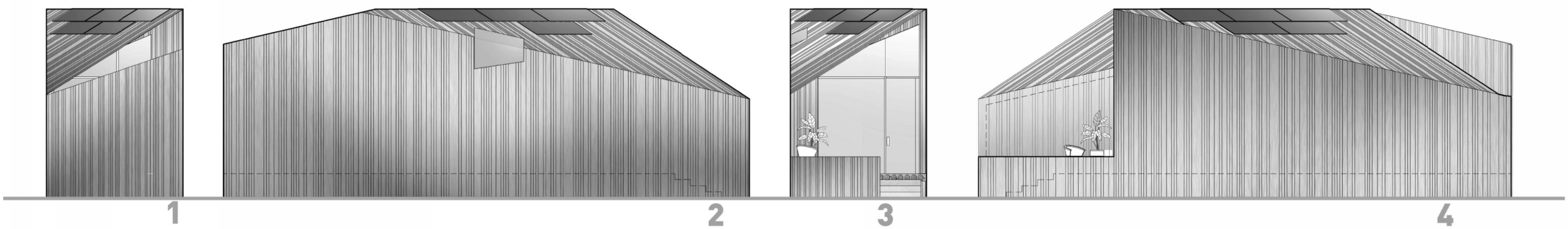
TRANSVERSE SECTION 1/4" = 1'



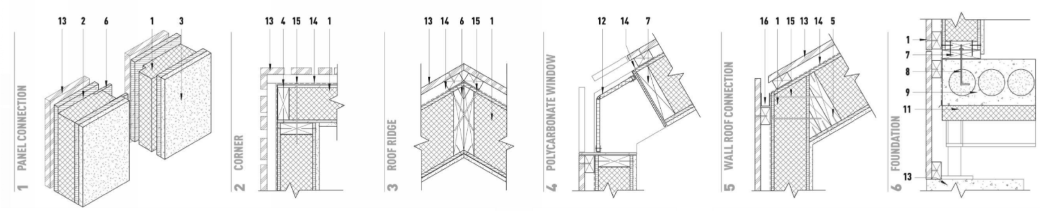
LONGITUDINAL SECTION 1/4" = 1'



ELEVATIONS 1/4" = 1'



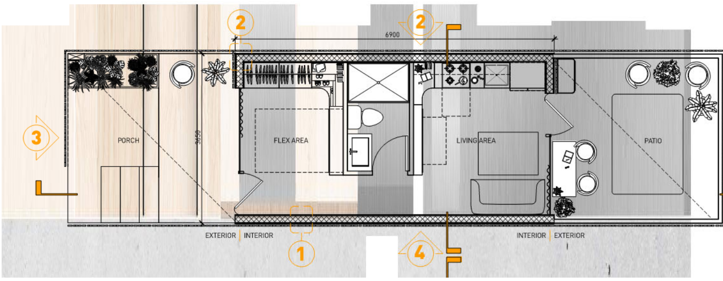
DETAILS 1"=1'



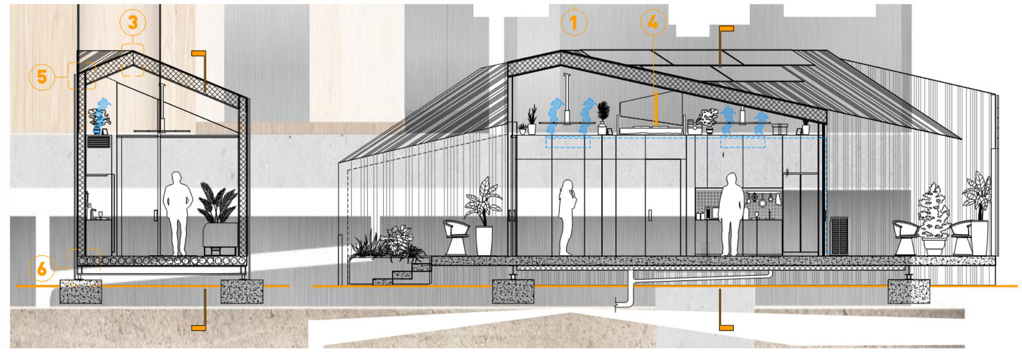
KEYNOTES

1. SIP WALL
2. ORIENTED STRAND BOARD
3. DRYWALL
4. 16d NAILS 2 ROWS @ 16" O.C.
5. 8d NAILS @ 6" O.C. EACH SIDE
6. WOOD SPLINE/BLOCKING
7. TOP/BOTTOM PLATE MATCHING SIP FOAM CORE THICKNESS
8. ANCHOR BOLT AS REQ. BY LOCAL CODE
9. HOLLOW CORE PLANK
10. PRE-CAST FOUNDATION BLOCK
11. RIGID INSULATION
12. HOLLOW CELL POLYCARBONATE PANEL
13. VENTILATED RAIN-SCREEN CLADDING
14. WEATHERPROOF BARRIER
15. SIPS SCREWS MIN. 1.5" PENETRATION INTO BEAM OR WALL 2' O.C. MAX
16. CONCEALED GUTTER

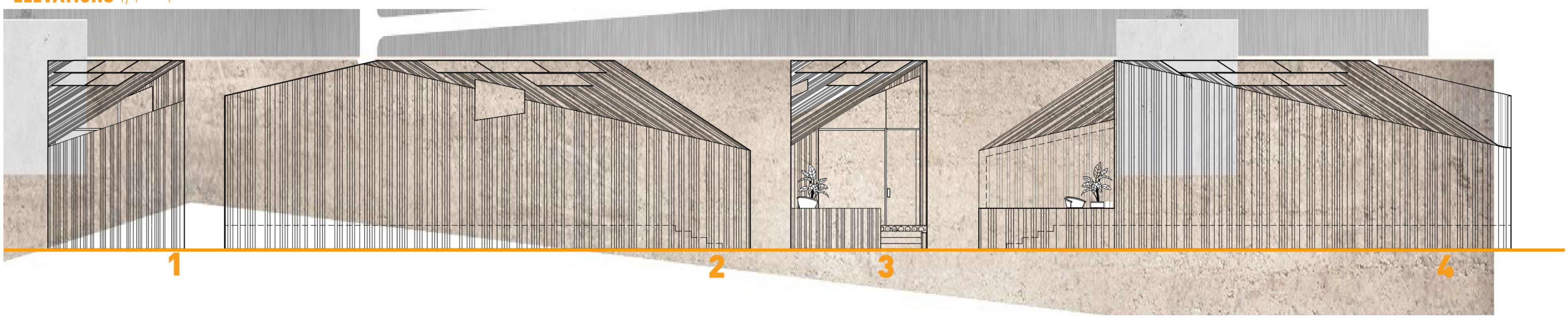
FLOOR PLAN 1/4"=1'



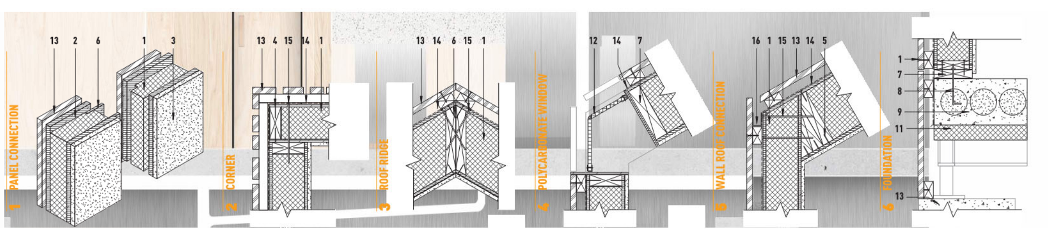
TRANSVERSE SECTION 1/4" = 1' LONGITUDINAL SECTION 1/4" = 1'



ELEVATIONS 1/4" = 1'



DETAILS 1"=1'



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16. CONCEALED GUTTER

5 + 6 + 7

8. Renderings

Exterior

Exterior: multi-unit option

Interior

9. Digital Material Board

Exterior materials

Thermally modified or Acetylated wood options.

STRAW: ABODO VULCAN CLADDING
Abodo

RADNOR: THERMALLY MODIFIED RED OAK
Red Oak

DENALI: ACCOYA WOOD
Accoya

SEQOYA: ACCOYA WOOD
Accoya

10. List & Description of Major Materials and Mechanical Systems

Major Materials

1. **Structural Insulated Panels (SIPs)**
   High-performance wall and roof panels with foam-core insulation sandwiched between oriented strand board (OSB) skins.

2. **Hollow-Core Precast Concrete Plank**
   Acts as both structural platform and subfloor, providing durability, load capacity, and thermal mass benefits. Fast installation minimizes on-site labor and disturbance.

3. **Ventilated Rain-Screen Cladding**
   Assembly incorporates an air gap behind the cladding to promote drainage and drying, enhancing envelope durability in all weather conditions.

4. **Acetylated Wood Cladding**
   Modified timber with improved dimensional stability, rot resistance, and reduced maintenance requirements. Sustainably sourced and long-lasting.

5. **Insulated Glazing**
   High-performance windows with low-E coatings to limit solar heat gain while maximizing natural daylight. Strategically located to optimize comfort and energy performance.

6. **Hollow-Cell Polycarbonate Panels**
   Lightweight, translucent material used for selective daylighting while maintaining privacy and diffusing glare.

Mechanical Systems

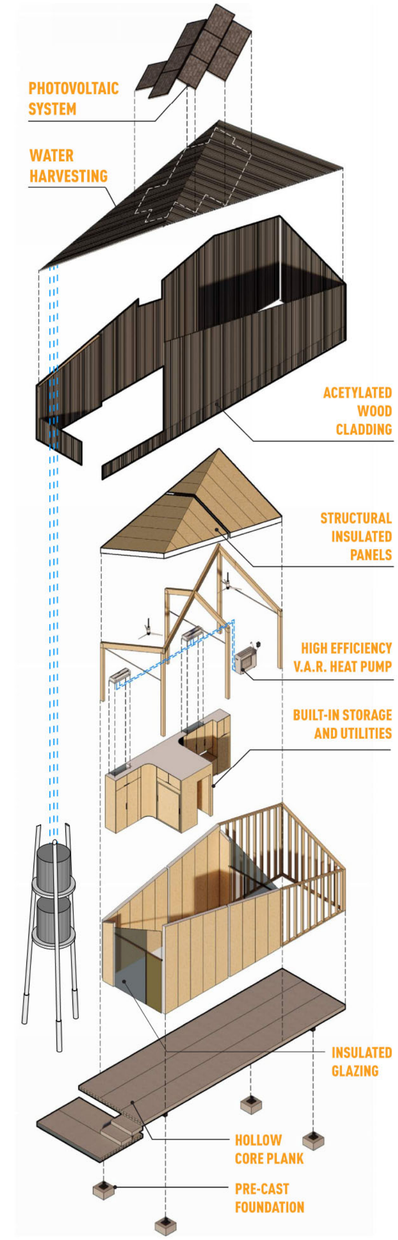
1. **High-Efficiency Variable Refrigerant Flow (VRF) Heat Pump**
   Provides heating and cooling with low energy consumption, precise temperature control, and quiet operation. Ideal for compact spaces with minimal ducting.

2. **Energy-Efficient Appliances**
   ENERGY STAR–rated refrigerator, cooktop/range, and optional combo washer/dryer reduce electricity and water use.

3. **LED Lighting**
   Long-life, low-energy fixtures throughout the unit to minimize operating costs and maintenance.

4. **Low-Flow Plumbing Fixtures**
   EPA WaterSense–labeled faucets, showerheads, and 1.28 GPF toilets conserve water without sacrificing performance.

5. **Optional Photovoltaic (PV) System + Rainwater Harvesting System**
   Roof-mounted solar array with inverter and interconnection capability for on-site renewable energy. Gutter-fed cisterns for supplemental irrigation and stormwater management.


PHOTOVOLTAIC SYSTEM
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ACETYLATED WOOD CLADDING
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HIGH EFFICIENCY V.A.R. HEAT PUMP
BUILT-IN STORAGE AND UTILITIES
INSULATED GLAZING
HOLLOW CORE PLANK
PRE-CAST FOUNDATION