

California Rebuilds - A Passive House Design Competition

A Mid Century Modern Case Study

In response to the challenge provoked by A Passive House Competition-California Rebuilds and the recent devastation of the Los Angeles wildfires:

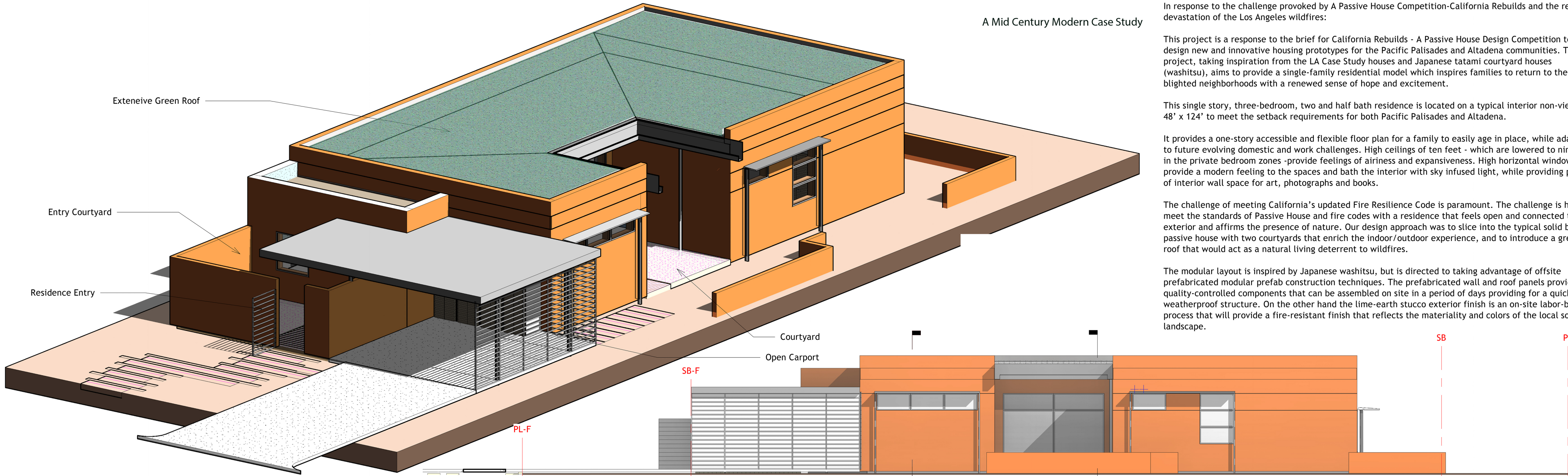
This project is a response to the brief for California Rebuilds - A Passive House Design Competition to design new and innovative housing prototypes for the Pacific Palisades and Altadena communities. This project, taking inspiration from the LA Case Study houses and Japanese tatami courtyard houses (washitsu), aims to provide a single-family residential model which inspires families to return to these fire blighted neighborhoods with a renewed sense of hope and excitement.

This single story, three-bedroom, two and half bath residence is located on a typical interior non-view lot 48' x 124' to meet the setback requirements for both Pacific Palisades and Altadena.

It provides a one-story accessible and flexible floor plan for a family to easily age in place, while adapting to future evolving domestic and work challenges. High ceilings of ten feet - which are lowered to nine feet in the private bedroom zones - provide feelings of airiness and expansiveness. High horizontal windows provide a modern feeling to the spaces and bath the interior with sky infused light, while providing plenty of interior wall space for art, photographs and books.

The challenge of meeting California's updated Fire Resilience Code is paramount. The challenge is how to meet the standards of Passive House and fire codes with a residence that feels open and connected to the exterior and affirms the presence of nature. Our design approach was to slice into the typical solid box of a passive house with two courtyards that enrich the indoor/outdoor experience, and to introduce a green roof that would act as a natural living deterrent to wildfires.

The modular layout is inspired by Japanese washitsu, but is directed to taking advantage of offsite prefabricated modular prefabric construction techniques. The prefabricated wall and roof panels provide quality-controlled components that can be assembled on site in a period of days providing for a quick weatherproof structure. On the other hand the lime-earth stucco exterior finish is an on-site labor-based process that will provide a fire-resistant finish that reflects the materiality and colors of the local soils and landscape.



1 Perspective Axonometric from the Street

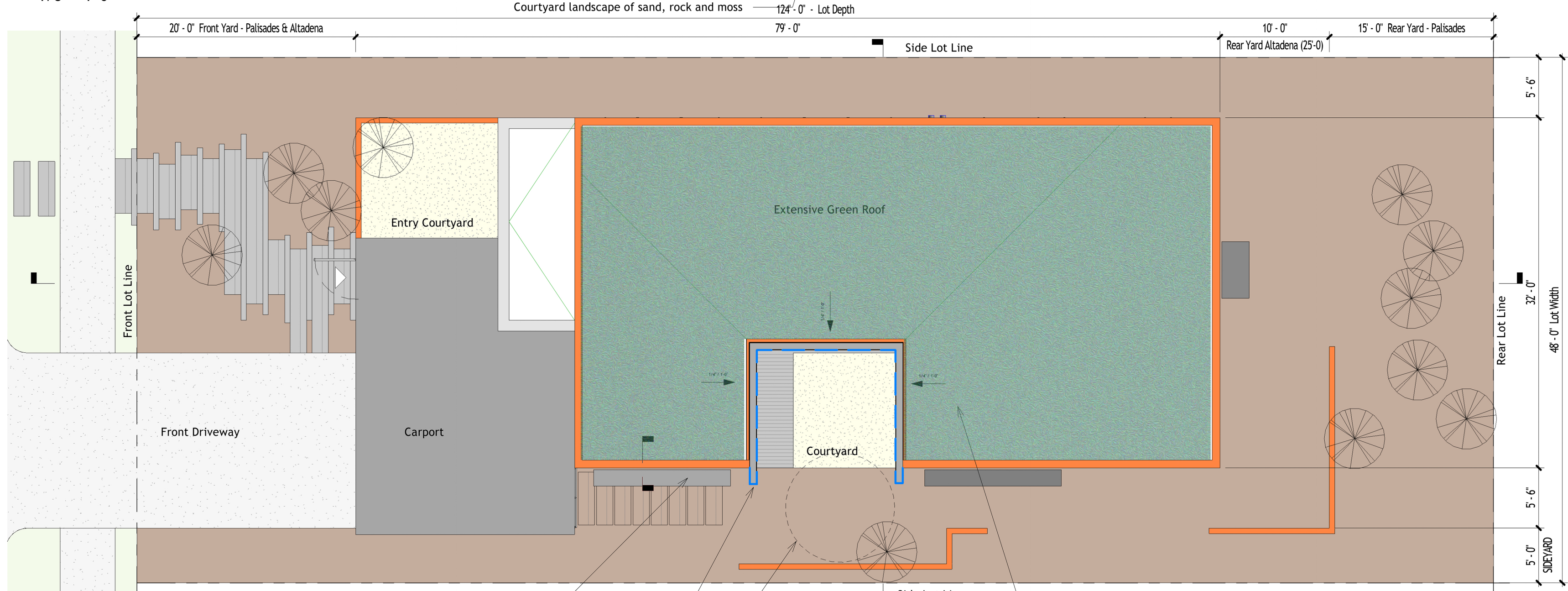
Key Project Characteristics:

- Passive House Classic Certification Requirements: The project design maximizes energy efficiency, comfort and health by meeting the Classic Passive House Certification Standard as evidenced by the submitted PHPP. Windows are triple pane, tempered and laminated to be fire safe. The exterior envelope is sealed to meet PH standard 0.6 ACH/hr at 50 Pascal which in conjunction with the provided ERV heat exchange system ensures that air quality is maintained during smoke events. Photovoltaic panels are not shown but the proposed green roof is primed to accommodate rooftop PV panels which would provide a route to a Passive House Plus rating.
- Pacific Palisades & Altadena Zoning: The proposed project will fit within and meet the setback requirements of both Pacific Palisades and Alta Dena providing flexibility in its applicability to different jurisdictions. It is designed to work within a typical internal lot that has no views or alley access and is therefore dependent on zoning mandated provision for a two-car garage off the street. The front entry meets the zoning standard by providing entrance to the residence via an enclosed and partially covered entry courtyard.
- Assuming no special offsite views the project proposes two courtyards that provide privacy, light, air and an intimate connection with the exterior. The entry courtyard provides a reflective interlude to the main entrance to the interior of the residence. The central courtyard animates the public social spaces of the residence including the living room, kitchen and dining area.
- Aging in place: The proposed single story walk-in residence meets the needs of a family in all phases of its changing structure from parents with children to empty nesters who are still fully engaged with work and community. The single story provides access to all spaces at all life stages. The residence is clearly programmed for public social spaces facing to the street and more quiet rooms to the rear. The public spaces are gracious and flexible with ten foot high ceilings and plenty of room for social gatherings. The dining area can second as a work home space and the extra bedrooms can also easily be converted to dens, offices and guest bedrooms.
- California Fire Resilience Code: The project meets the intent of the code by:
 - Landscaping: providing a 5-wide zone surrounding the residence devoid of landscaping material or flammable material. This zone is characterized by hardscape material of stone, gravel and sand which is set in runnels that can direct and drain rainwater runoff to landscape swales in the year yard or to an underground cistern near the central courtyard.
 - Greenroof: The project proposes that a green roof is a fire smart approach to fire safety if properly installed and maintained. The extensive green roof (EGR) is defined by its shallow (less than 6") of growing substrate with low organic content and the selection of plant material that is naturally drought-tolerant and fire-resistant due to its high moisture content. The green roof is irrigated and sloped to drain to gutters which can direct rainwater to cisterns below grade for use in fire events.
 - Reference from the publication "Green Roofs and Fire Resilience: Extending the Defensible Space above Ground" from Living Architecture Monitor:
 - The green roof provides additional benefits by lowering the heat island effect while providing additional cooling to the residence below and the surrounding community.
 - The green roof is an element of "sponge city", an urban planning approach that uses nature-based solutions and green infrastructure to absorb, store, and naturally filter rainwater, preventing floods and managing water resources
 - All Landscape material is selected to meet fire-smart vegetation standards per 2025 California Wildland-Urban Interface Code Title 24 Part 7- Appendix F Characteristics of Fire-Smart Vegetation.
 - Exterior Wall Finishes. The exterior walls are finished with lime and earth-based plaster over continuous mineral wool insulation providing exterior fire resistance.
 - All exterior vents to enclosed spaces are to be fully covered with Wildland Flame and Ember resistant (WUE) vents approved by CAL Fire
- The design is purposefully modular and simple in plan to allow for off-site pre-fabrication of modular wall and roof components and fast on-site erection. Pre-fabrication of exterior panels in controlled environment fabrication plants assures the quality of the thermal envelope panels whose joints are then sealed on-site
- Materials: The project proposes to use bio-based materials where appropriate and exclude Red List materials. The exterior lime based earth stucco is purposefully selected to be fire resistant and to use bio-based roughage and pigments to reflect the local terra.

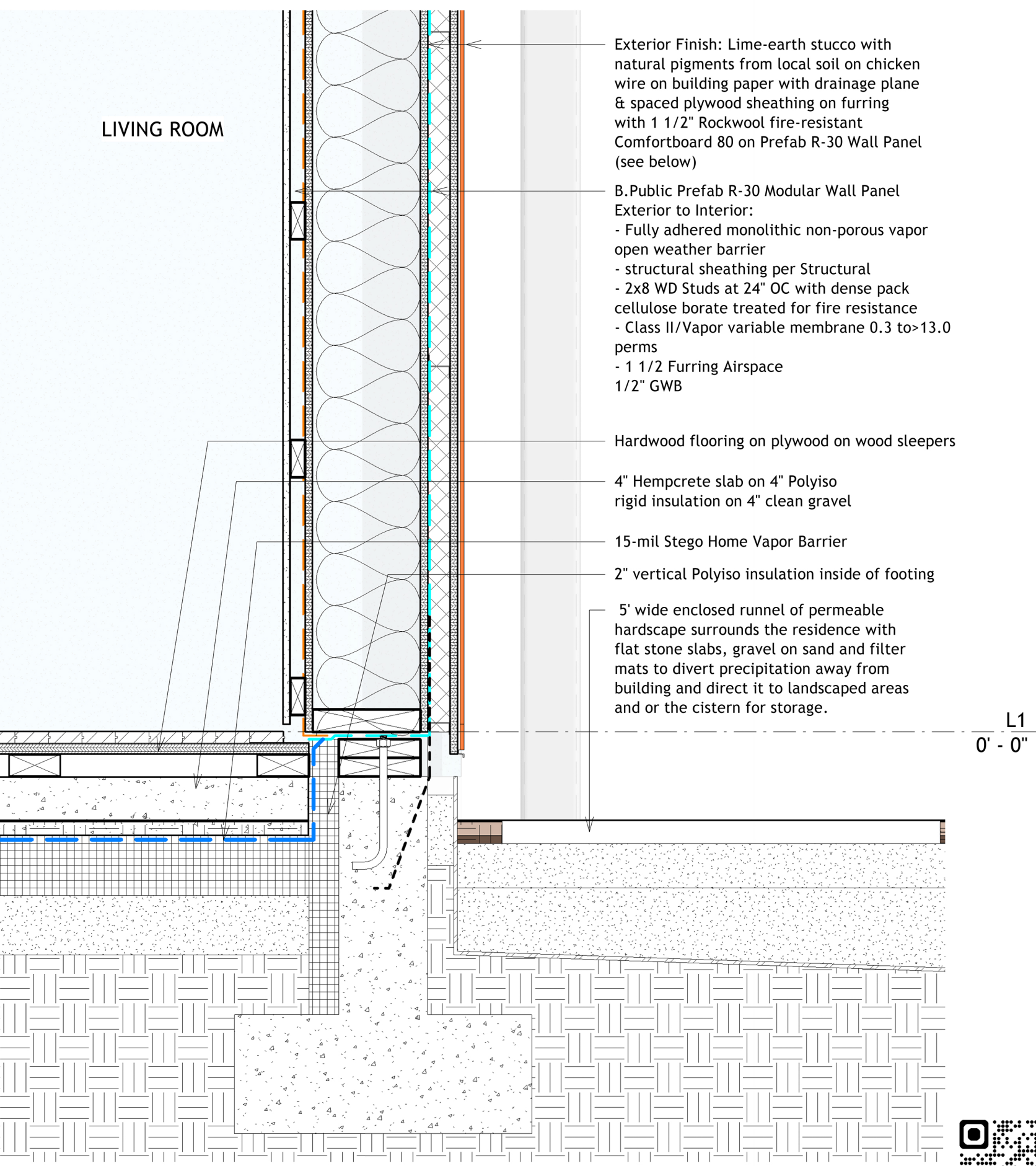
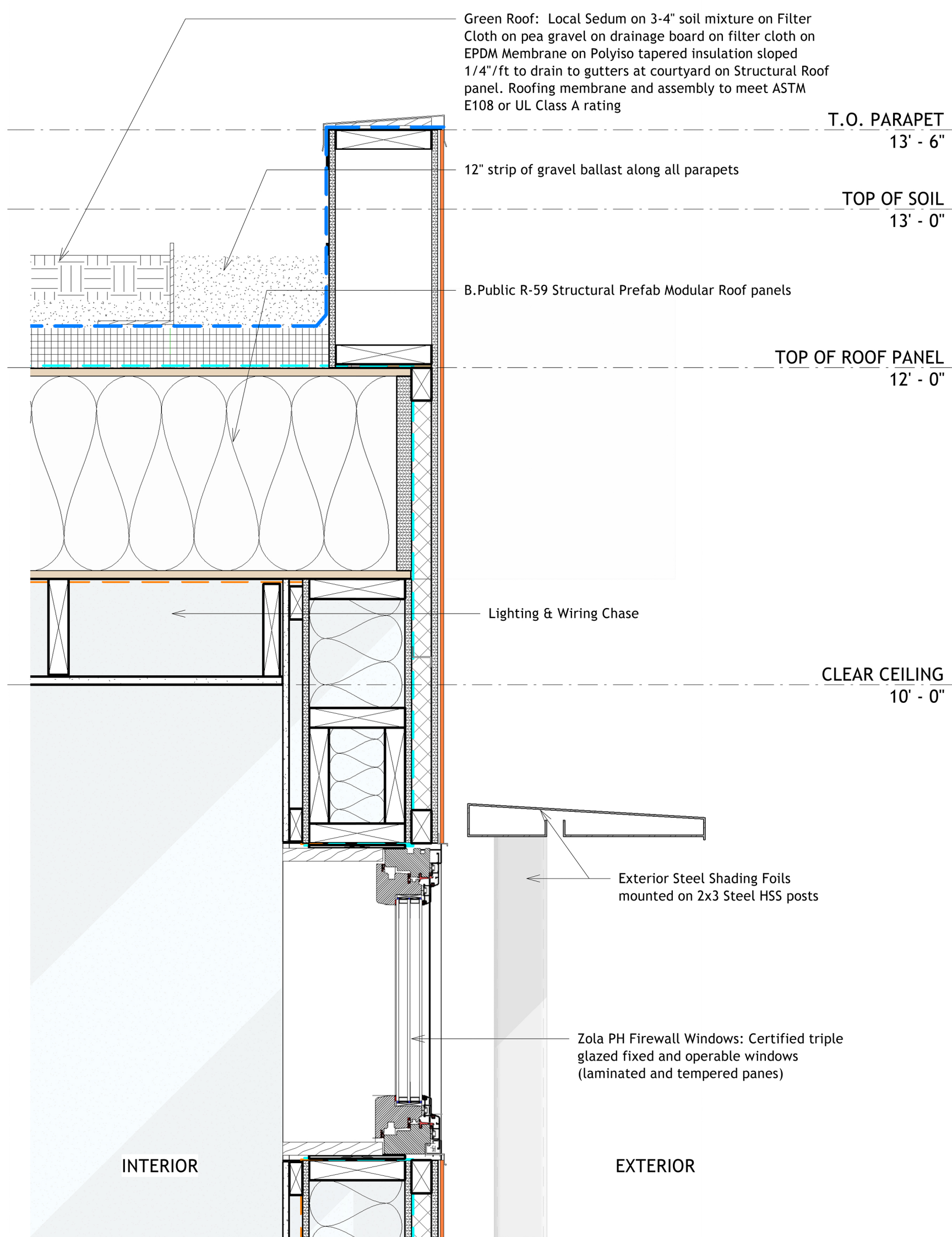
2 South Elevation
1/8" = 1'-0"



3 Ground Level Floor Plan
1/8" = 1'-0"



4 SITE PLAN
1/8" = 1'-0"



5 WALL SECTION @ LIVING ROOM-LOOK EAST
1 1/2" = 1'-0"

