

Sunflower Sanctuary

Louisville, CO

Single Family Building

New Build

PHI Database ID#: N/A

Certification Goal:



Status: Pending - in construction

Size: 2,572 FT² TFA with One Unit

Description: Referred to as the Sunflower Sanctuary for its promise of comfort and resilience following 2021 Marshall Fire, this single-family PHI Low-Energy Building is optimized for both passive and active solar and designed to maximize the outdoor areas of the site.

DOE Climate Zone: 5b

Team:

Owner:

Kevin & Casey Lombardo

Architect/Designer:

Shape Architecture Studio,
<https://shapearchitect.com>
Steve Scribner, Morgan Law, Maggie Wohltjen

PH Consultant:

BldgTyp, <https://www.bldgtyp.com>
Ed May, Dave Parker

MEP Design:

Colorado Eco Mechanical, Daniel Howell
<https://coloradoecomechanical.com>

Structural Engineer:

Lopez Smolens Engineer, Ian Smith
<https://lopezsmolensengineers.com>

Builder:

Living Craft, <https://www.livingcraft.com>
Frank Wetenkamp, Cheryl Corsiglia

Certifier:

Tad Everhart



After the Lombardo family lost their home in the Marshall Fire, they saw an opportunity to combine their passion for the environment with the long road of rebuilding with a Passive House. When they saw the issues with underinsurance, building codes, and more, they knew they had to share their experience and help spread the possibilities and excitement of high-performance home building to their local community.

1	entry	7	living room	12	primary bedroom
2	guest bedroom	8	dining room	13	laundry
3	office	9	kitchen	14	kids bedroom
4	office / art studio	10	pantry	15	kids bedroom
5	mechanical storage	11	roof deck	16	shade trellis
6	garage				



They participated in an article and mini-documentary on Rocky Mountain PBS, have volunteered with the Colorado Green Building Guild, and continue to be a point of contact for several neighbors and community members to help others get started rebuilding to a high standard.

The design optimizes a small, sloping lot for light, privacy, views, and comfort. Active and passive solar, expansive triple-pane windows with expansive southern views, an airtight envelope and energy recovery ventilation were all utilized to meet Passive House standards.

Thermal Envelope

Ground:

10" EPS Insulation, Vapor Barrier, (2) layers 3/4" OSB, engineered hardwood finish
U-value = 0.023 Btu/(h/ft²/F)

Walls:

Foundation (Basement Walls): 8" concrete stemwall, 4" rigid insulation, 2x4 insulation service cavity, gypsum board
U-value = 0.033 Btu/(h/ft²/F)

Above-grade walls: double stud wood frame (12") with dense-pack cellulose, smart air/vapor barrier (intello), 1.5" interior service cavity, gypsum board
U-value = 0.023 Btu/(h/ft²/F)

Roof:

Asphalt shingle assembly, underlayment, sheathing, vent channel, weather barrier (solitex mento plus), 14" TJJ with dense-pack cellulose, air barrier (intello), insulated service cavity, gypsum board
U-value=0.02 Btu/(h/ft²/F)

Windows & Doors:

Alpen Tyrol PH+

Shading Strategies:

West: Wood shade trellis with partial metal roof cover, interior shades
South/Southwest: Custom metal projections @ window heads (20" overhang), interior shades

Mechanical Systems:

Ventilation:

Zehnder ComfoAir Q600; ERV with 80% efficient heat recovery system and 68% humidity recovery

Heating:

Mitsubishi air to air heat pump system with central air handler serving lower two levels, and mini-split units serving upper level

Cooling/Dehumidification:

Heat pump system, no dehumidification

Domestic Hot Water:

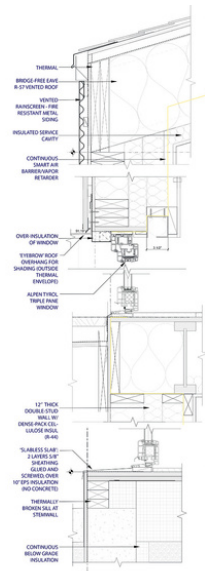
Rheem Hybrid Hot Water Heater (electric)

Onsite Renewable Energy:

Solar

PHPP Values

Climate: Warm-temperate	Cooling & Dehumidification Demand: 4.29 kBtu/ft ² /yr
Airtightness: 0.3 ACH50	Cooling Load: 2.71 Btu/hft ²
Annual Heating Demand: 9.02 kBtu/ft ² /yr	PE Demand: 25.68 kBtu/(ft ² /yr)
Heating Load: 6.51 Btu/hft ²	PER Demand: 12.43 kBtu/ft ² /yr



A light-filled living/dining space opens out onto a generous garage rooftop terrace that connects the living spaces on the 2nd floor to the secluded rear yard. A trellis will provide shade and protection from weather, and integrated planters will enliven the structure with greenery. The design maximizes space with lofts in the high point of the roof gable in kids' rooms as well as a secret lab in the lower level.



Shape Architecture is proud to work with those affected by the Marshall Fire in rebuilding homes in our Boulder community to be more resilient, durable, healthy, and comfortable. Passive House designs make this possible.