



# Thrive Home Builders

The Panacea Collection  
Denver, CO



## BUILDER PROFILE

Thrive Home Builders  
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## FEATURED HOME/DEVELOPMENT:

### Project Data:

- Name: The Panacea Collection
- Location: Denver, Colorado
- Layout: 5 bdrm, 5.5 bath, 2 fl + bsmt, 5,004 ft<sup>2</sup>
- Climate: IECC 5B, cold
- Completed: May 2022
- Category: Production

### Modeled Performance Data:

- HERS INDEX: without PV: 42; with PV: 9
- Annual Energy Costs: without PV: \$2,300; with PV: \$350
- Annual Energy Cost Savings: without PV: \$4,200; with PV: \$6,150
- Annual Energy Savings: without PV: 19,300 kWh, with PV: 34,850 kWh
- Savings in the First 30 Years: without PV: \$170,300; with PV: \$249,000

Thrive Home Builders' zero energy ready home building approach has powered its push to build healthier, more energy efficient, and more comfortable homes and this year propelled the Denver, Colorado, builder to its 13th Housing Innovation Award and 11th Grand award in the U.S. Department of Energy's Zero Energy Ready Home Housing Innovation Awards. The 2022 entry was a 5,004-ft<sup>2</sup> home in the builder's Panacea collection at Denver's Central Park, a planned community on the former Stapleton Airport site. The home features zero fossil-fuel-burning appliances, zero VOC paints, and net zero electric bills, thanks to Thrive Home Builders' adherence to the requirements of the DOE Zero Energy Ready Home program.

Every home certified through the DOE Zero Energy Ready Home program is also certified to meet the requirements of the ENERGY STAR Certified Homes program and the U.S. Environmental Protection Agency's Indoor airPLUS program. Builders must also meet other efficiency requirements like the hot water distribution requirements of the EPA's WaterSense program; the insulation requirements of the 2015 International Energy Conservation Code; HVAC and water heating efficiencies; third-party-verified air sealing targets; installation of ENERGY STAR appliances, windows, and lighting; and ducts in conditioned space. In addition, homes are required to have solar electric panels installed or have the conduit and electrical panel space in place for it.

Thrive Homes built 96 single- and multi-family homes in 2022, all of them certified to the DOE program. Since 2013 Thrive Home Builders has committed to building all of its homes to meet the DOE Zero Energy Ready Home criteria. Upon closing, each buyer is provided with their home's Home Energy Rating System (HERS) certificate, accompanied by a report confirming "Your home was designed, engineered, and constructed in conformance to U.S. Department of Energy (DOE) guidelines for extraordinary levels of excellence and quality." "Thrive Home Builder's brand is



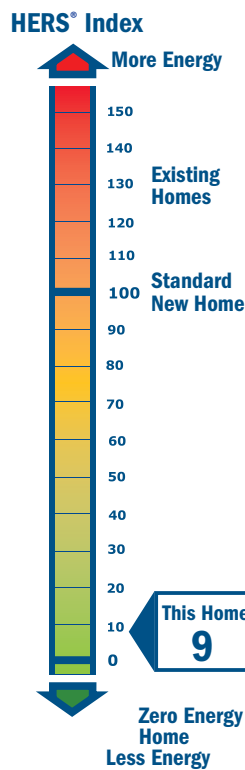
The U.S. Department of Energy invites home builders across the country to meet the extraordinary levels of excellence and quality specified in DOE's Zero Energy Ready Home program. Every DOE Zero Energy Ready Home starts with ENERGY STAR Certified Homes Version 3.0/3.1/3.2 for an energy-efficient home built on a solid foundation of building science research. Advanced technologies are designed in to give you superior construction, durability, and comfort; healthy indoor air; high-performance HVAC, lighting, and appliances; and solar-ready components for low or no utility bills in a quality home that will last for generations to come.

The all-electric home has a non-combustion induction cooktop and electric fireplace. The home has LED lighting and ENERGY STAR-labeled dishwasher, clothes washer, clothes dryer, and exhaust fans. The WaterSense-rated plumbing fixtures and high-efficiency 3.55 UEF 65-gallon heat pump water heater with PEX piping and a button-activated recirculation pump add to utility savings.



### What makes a home a DOE ZERO ENERGY READY HOME?

- 1 **BASELINE**  
ENERGY STAR Certified Homes Version 3.0/3.1
- 2 **ENVELOPE**  
meets or exceeds 2012 IECC levels
- 3 **DUCT SYSTEM**  
located within the home's thermal boundary
- 4 **WATER EFFICIENCY**  
meets or exceeds the EPA WaterSense Section 3.3 specs
- 5 **LIGHTING AND APPLIANCES**  
ENERGY STAR qualified
- 6 **INDOOR AIR QUALITY**  
meets or exceeds the EPA Indoor airPLUS Verification Checklist
- 7 **RENEWABLE READY**  
meets EPA Renewable Energy-Ready Home.



centered on three pillars: efficient, healthy, and local. We believe our homes should be built to the highest standards of health and sustainability, creating a space where families can grow and thrive,” said Thrive Home Builder’s Chief Operating Officer Bill Rectanus. There are several builders at Central Park. Rectanus felt that Thrive’s reputation as a zero energy home builder is one of the main reasons buyers seek out Thrive to build their new home. “Often, this is their second or third home built by Thrive,” said Rectanus.

Central Park has become one of the most desirable neighborhoods in Denver and the community frequently achieves top rankings in health, well-being, quality of life, education, and art, and Thrive Home Builders embraces that healthy home perspective. “The EPA Indoor airPLUS certification (a DOE Zero Energy Ready Home requirement) is just a starting point of our superior health features and is enhanced by active radon systems, advanced MERV 13 air filtration, and balanced ventilation to draw clean, fresh air into the home and to remove bacteria, allergens, and mold,” said Rectanus. In addition to the low- and no-emission Green Label and GreenGuard products used in the home, the all-electric home is equipped with high-efficiency heat pumps for space and water heating as well as an induction cooktop and electric fireplace to further minimize harmful emissions within the home without sacrificing quality and performance. The home is equipped with a smart indoor air quality monitor to measure and monitor radon, VOCs, CO<sub>2</sub>, particulates, humidity, and temperature. Recent wildfires have highlighted the need for air cleaning. In addition to MERV 13 filters on the central air handler and fresh air intake, Thrive has also installed a separate air cleaning system that uses multiple filters and sterilizer technologies, including carbon/potassium permanganate filters, a photo catalytic oxidation filter, and UVC germicidal light to remove smoke, dust, allergens, contaminants, viruses, molds, and odors. Because research has shown that air that is too dry can also be harmful to the body, the home is equipped with an automatic steam humidifier.

To help homeowners monitor their solar energy production and manage their energy usage, the home is equipped with an energy monitoring system that tracks power production and end uses throughout the day. The home is equipped with several other smart WiFi- or Bluetooth-connected appliances including the dishwasher, induction cooktop, range hood fan, the double oven, the clothes washer and dryer, and the garage door opener. The HVAC system is equipped with a smart thermostat that will alert homeowners to service issues. The home also has a smart security system which includes a doorbell camera with full-color 180-degree video, night vision infrared up





The all-electric home is equipped with a high-efficiency, 10-HSPF, 19.5-SEER central heat pump. All of the ducts are mastic-sealed rigid-metal ducts located within the conditioned space of the home. The duct layout is compact with throws from interior walls to limit duct length and improve distribution efficiency. Each floor has a centralized return and transfer grilles are used where needed to improve return air flows. The central air handler has a MERV 13 filter.

to 8 feet, two-way audio, and a motion sensor; a smart deadbolt; sensor door and window contacts; and cameras to capture disarm photos, alarm videos, and chimes to let homeowners know when doors or windows open or the doorbell rings.

Because Central Park is a master-planned community, the master developer determined the lots Thrive received so the lots were scattered across the community and not necessarily designed for maximum solar potential. Thrive's architects designed the Panacea Collection homes with only one floor plan and two elevations – Modern Farmhouse and Mid-Century Modern. Roof designs and solar sizing strategies were thoughtfully determined to maximize the solar potential for each home, regardless of orientation.

The 2022 award-winning home has 9.88 kW of solar panels installed on the roof plus a 10-kW home battery. The home achieved a Home Energy Rating System (HERS) score of 9 with the PV or 42 without the PV on the roof.

All homes in Central Park are required to be ENERGY STAR qualified. Thrive Home Builders went beyond that in specifying DOE Zero Energy Ready Home certification. The home also received a platinum-level certification from the USGBC LEED for Homes program. "We believe quality is quantifiable, and we look to third-party certification programs as one way to set and meet our standards," said Rectanus. All of the homes within Thrive's Panacea Collection will achieve a HERS score of 15 or lower, providing comfort, quiet, durability, a healthier indoor environment, lower operating costs, and higher resale values.

To meet the efficiency requirements of the DOE Zero Energy Ready Home program for its cold climate location, Thrive constructed the 2022 grand award-winning home with a double-walled envelope consisting of two 2x4 walls set at 2.5 inches apart with studs at 24 inches on center and staggered to further reduce thermal bridging between the outer studs and inner studs. Advanced framing provides more room to fill the double-wall cavity with 9.5 inches of blown fiberglass for an R-39 total insulation value. The walls are sheathed with OSB, wrapped in corrugated house wrap, and sided with engineered wood siding. Rigorous air sealing measures include the taped house wrap, closed-cell spray foam at all rim joists, and canned spray foam at all top plates. Closed-cell foam sealant was carefully applied around electrical boxes, wall penetrations, and the joint between the bottom wall plate and the floor. These measures helped the home achieve an air tightness of only 1.34 air changes per hour at 50 Pascals (ACH50).

## HOME CERTIFICATIONS

DOE Zero Energy Ready Home Quality Management Guidelines

DOE Zero Energy Ready Home Program - 100% Commitment

ENERGY STAR Certified Homes Version 3.0

EPA Indoor airPLUS

LEED for Homes



Every DOE Zero Energy Ready Home combines a building science baseline specified by ENERGY STAR Certified Homes with advanced technologies and practices from DOE's Building America research program.



Advanced framing features include double walls with 2x4s at 24 inch on center, 2-stud corners, and right-sized window headers.

them to a vertical, fan-assisted stack, which carries these gases out through the roof. In addition, a 4-inch perforated plastic foundation perimeter drain pipe leads to a sump pit and pump to protect the home against any future high ground water.

The double-pane vinyl-framed windows have an argon gas fill and low-emissivity coating to slow heat transfer, resulting in a U-factor of 0.23 and a solar heat gain coefficient of 0.21.

Among the disaster risks of the location are high wind and snow loads. This home includes shear walls, framing, and roof reinforcement as provided in the site-specific structural plans of the building. This building is designed to meet snow loads of 30 PSF and wind speeds of up to 115 MPH. The home's 9.88 kW of PV and 10-kW battery will allow the home to function at close to normal even during extended power outages.

Thrive engages with its energy consultant, mechanical contractor, and other trade partners early in the design stage to ensure its designs are on target with performance expectations, to maximize efficiency, and to coordinate trades and services to avoid adjustments during the framing stage. Building footprints are kept intentionally simple and floors stack as much as possible to maximize the efficiencies of the thermal envelope and simplify the air barrier. To reduce costs and complexity for its vendors and trade partners, familiar products and technologies are specified where possible. Thrive also employs an extensive quality management program throughout the organization and trade participation is actively encouraged in this process through a trades council. Since implementing customer-focused quality management practices a few years ago, Thrive consistently receives high marks from its home buyers. Thrive Home Builders assigns its home buyers a customer service coordinator and provides a one-year limited warranty that includes a 30-day check-in, 90-day and 11-month warranty reviews, and emergency care as needed.

The engineered truss roof is sheathed in 7/16-inch OSB, covered with a 10-mil synthetic underlayment and ice-and-water shield at the valleys and roof edges, and topped with 30-year asphalt shingles. The vented attic is insulated with 16 inches (R-50) of blown insulation and 14-inch raised heel trusses help ensure full insulation coverage over the top plates.

The concrete walls of the basement are insulated on the interior with R-15 batt insulation in the 2x4 framed walls of the finished sections of the basement and with R-19 perforated drape in the unfinished areas. A waterproofing membrane was spray applied to the exterior of the basement walls. The slab sits on a 4-inch base of clean gravel topped by a 6-mil vapor barrier. A perforated pipe is installed in the gravel to collect radon and other soil gases and direct

## KEY FEATURES

- **Walls:** Double wall, R-39 total: two 2x4 24" o.c. walls set 2.5" apart, advanced framed, 9.5" R-39 blown fiberglass, 7/16" OSB sheathing, drain wrap, engineered wood siding.
- **Roof:** Gable truss roof: 10-mil synthetic underlayment, 30-year asphalt shingles.
- **Attic:** Vented attic: 16" R-50 blown-in fiberglass, 14" raised energy trusses.
- **Foundation:** Basement: poured concrete; finished basement walls are 2x4 24" o.c. with R-15 fiberglass batts. Unfinished walls have R-19 fiberglass drape. Active radon vent.
- **Windows:** Double-pane, argon-filled, low-e, vinyl frame, U=0.23, SHGC=0.21.
- **Air Sealing:** 1.34 ACH50, closed-cell spray foam rim joists, canned foam at all top plates.
- **Ventilation:** Continuous exhaust + fresh air supply; temperature and humidity sensors.
- **HVAC:** Central air-source heat pump, 10 HSPF, 3.24 COP, 19.5 SEER, compact duct design.
- **Hot Water:** Heat pump water heater, 3.55 UEF, 65-gal.
- **Lighting:** 100% LED lighting.
- **Appliances:** ENERGY STAR dishwasher, refrigerators, clothes washer, clothes dryer.
- **Solar:** 9.88-kW rooftop panels, 10-kW battery storage.
- **Water Conservation:** EPA WaterSense rated low-flow fixtures, PEX piping: push-button hot-water recirculation pipe. Drip and smart irrigation.
- **Energy Management System:** Monitoring system tracks energy production and usage. Wi-Fi appliances and doorbell.
- **Other:** No-VOC paint, Green Label Plus carpet, KCMA-certified cabinetry, GreenGuard certified hardwood flooring. Prewired for EV charging.

*Photos courtesy of Thrive Home Builders*