



Thrive Home Builders

The Vitality Collection
Denver, CO



BUILDER PROFILE

Thrive Home Builders

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FEATURED HOME/DEVELOPMENT:

Project Data:

- Name: The Vitality Collection
- Location: Denver, Colorado
- Layout: 4 bdrm, 4.5 bath, 2 fl plus basement, 3,934 ft²
- Climate: IECC 5B, cold
- Completed: August 2020
- Category: Production

Modeled Performance Data:

- HERS Index: without PV: 39; with PV: 5
- Annual Energy Costs: without PV: \$1,500; with PV: \$200
- Annual Energy Cost Savings: (vs typical new homes) without PV: \$2,200; with PV: \$3,300
- Annual Energy Savings: without PV: 19,700 kWh; with PV: 31,100 kWh
- Savings in the First 30 Years: without PV: \$88,300; with PV: \$134,500

Thrive Homes has won its 10th straight grand award in the U.S. Department of Energy's Housing Innovation Awards, which recognizes exceptional builders among those participating in the DOE's Zero Energy Ready Home Program. Thrive, a regional builder of production single-family detached and attached homes and affordable homes in the Denver metro area has made a commitment to build all of its homes to the high performance criteria of the DOE Zero Energy Ready Home program. That includes certifying the homes to the program checklists of ENERGY STAR Certified Homes Version 3.0, 3.1, or 3.2 and the U.S. Environmental Protection Agency's Indoor airPLUS. Builders must also meet other efficiency requirements like the hot water distribution requirements of the EPA's WaterSense program; the insulation requirements of the latest 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.

The Denver area builder is nearly tied for most DOE ZERH certified homes built, having certified 1,136 homes since the program began in 2012. Thrive has been recognized with DOE Housing Innovation Awards every year since 2013 and has received 12 Housing Innovation Awards including grand awards in every year as well, including five in the production home category, four in the multifamily category, and one in the affordable home category. Thrive Homes received a grand award this year in the production home category.

This year's award-winning home is part of Thrive Home's Vitality collection, a select community of 39 DOE Zero Energy, zero-carbon, all-electric, LEED Platinum, EPA Indoor airPLUS qualified, ENERGY STAR labeled, solar-powered single-family homes. The homes are located in the master-planned community of Central Park which began in 1995 when the City of Denver closed the Stapleton International



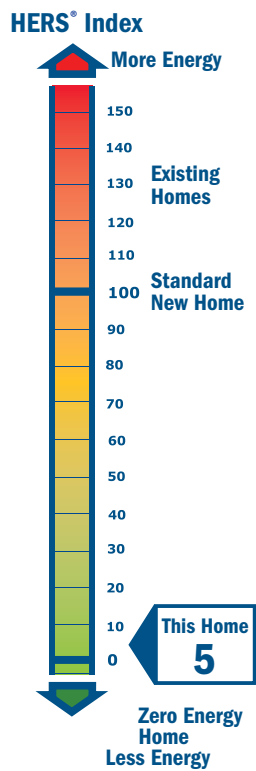
The U.S. Department of Energy invites home builders across the country to meet the extraordinary levels of excellence and quality specified in DOE's Zero Energy Ready Home program. Every DOE Zero Energy Ready Home starts with ENERGY STAR Certified Homes Version 3.0/3.1/3.2 for an energy-efficient home 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.

ENERGY STAR appliances and windows, LED lighting, and a heat pump water heater save energy throughout the all-electric home, which is heated and cooled with a highly-efficient central heat pump. These features together with the high-efficiency building envelope will save homeowners more than \$2,000 a year in energy bills without even taking into account the additional \$1,100 a year in energy savings from the solar energy system.



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.



Airport and converted the 7.5 square miles of runways and terminals into a series of walkable neighborhoods that incorporate energy efficiency, water-wise landscaping, and mixed-use planning to develop what would become the largest urban infill redevelopment in the country.

“Central Park is a master-planned community, and as such, the master developer determines the lots we receive. As a result, the lots are scattered across this planned community. Thrive worked with its solar installer and architectural team to maximize the solar potential for each home, regardless of orientation on the lots,” said Bill Rectanus, Thrive Home’s Vice President of Home Building Operations. The award-winning home was able to achieve a Home Energy Rating System (HERS) score of 5 with a 7.8-kW array of solar panels, plus a battery storage system.

Presented with wide shallow lots that other homebuilders could not accommodate, Thrive Home Builders took it as an opportunity to design the Vitality homes’ large, welcoming front porches, which offer increased street appeal and more of the indoor/outdoor living that Coloradans cherish. The front porch lends itself to the home’s farmhouse style with wide entrance, open concept living area, electric fireplace, and open-rail staircase to second-floor bedrooms. The homes in the Vitality collection range from 2,378 to 3,393 square feet with 3 to 5 bedrooms, a study, loft, and basement that allow plenty of room for family members to work, learn, and play at home. Alley-loaded garages and usable back yards with porches and patios enhance the interior-exterior spaces.

This attention to design details also comes into play in the energy efficiency of the homes. “Thrive engages with our energy consultant at an early stage of the design process to ensure our designs are on track with our performance expectations. Thrive engages trade partners early in the design, to get feedback on mechanical, plumbing, and framing layouts. Thrive minimizes rooms over unconditioned spaces and building footprints are kept intentionally simple. “This maximizes the efficiencies of our thermal envelope and air barrier and reduces complexity for our vendors. Thrive believes that simple can be both efficient and beautiful,” said Rectanus.

“We believe quality is quantifiable, and we look to third-party certification programs as one way to set and meet our standards. As such, we are currently complying with ENERGY STAR Certified Homes, EPA Indoor airPLUS, USGBC LEED for Homes, and the U.S. Department of Energy’s Zero Energy Ready Home program. Thrive also partners with EnergyLogic to carefully inspect our homes to ensure compliance with all these certification programs,” said Rectanus.



Foam fabric gaskets will provide an airtight seal when the drywall is installed. The exterior walls are all double, consisting of two 2x4 24-inch on-center walls set 2.5 inches apart to provide a nearly 10-inch-deep wall cavity that is filled with R-39 of blown fiberglass, sheathed with OSB, wrapped in draining house wrap, and covered with engineered wood siding. For additional air sealing, house wrap seams are taped, rim joists are sealed with closed-cell spray foam, and canned spray foam is used at all top plates, around electrical boxes, at wall penetrations, and at the joint between the bottom wall plate and the floor.

To ensure quality workmanship and proper building material installation throughout construction, Thrive embedded several checkpoints throughout the construction schedule. The “perfect start” is a process and checklist designed to ensure that the Community Project Manager (CPM) has all essential documents and information prior to starting a home. Prior to 2020, this process included tracking physical paperwork between the Operations Manager and the Project Manager. Due to conditions in 2020, the process transitioned to an online tracking calendar. During the weekly Starts Meeting, each home is discussed to ensure proper completion and submittal of necessary documents such as design selections, permits, and overall lot readiness. These documents are required to be submitted and reviewed three weeks prior to the start of the home. Thrive provides trade partners with specific scopes of work. Thrive also developed a set of standard construction details to complement construction plans. These plans reference guides by building scientist Joseph Lstiburek.

Thrive Home Builders created an internal Quality Assurance Department to develop continuous improvement across all departments including construction, purchasing, architecture, warranty, and vendor-partner relations. In addition to utilizing third-party inspections, the Quality Assurance Department has implemented a quality assurance management program called FTQ360. This program allows Thrive to document and correct issues during construction, as well as review best practices, through a series of QA checklists at critical stages of construction.

A successful professional relationship is largely based on a partnership where feedback is welcomed and can be given on both sides. Thrive completed a LeanBuilding Blitz and formed a Thrive Vendor Council to identify improvement opportunities and implement new processes and procedures with the broader trade base. Frequent planned meetings are part of the communication process. Every project starts with a preconstruction meeting to review all plans and timelines. A new community kick-off meeting is held two weeks prior to the opening of sales. Thrive also holds weekly project huddles including the sales, construction, and customer service teams.

Two years ago, Thrive introduced TrueNorth Development’s TradeCOMM supplier/trade feedback system to get good, independently measured information from trades on how to improve toward becoming the builder of choice. “We learned a great deal,” said Rectanus. “TradeCOMM showed us areas where we need to improve, such as having all work done under contract or purchase orders, having more effective systems to get work done, and reducing the paperwork burden.” Thrive resurveyed trade partners at the end of the 2018 Lean focus. Per Scott Sedam of TrueNorth, Thrive “reported the biggest year-to-year score improvement they have ever seen in

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

Thrive Home Builders’ approach to protecting itself against construction litigation is to first build a defect-free home.



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.



PEX piping and a hot water recirculation pump speed hot water to fixtures.

10 years running the survey with more than 75 builders nationwide.” Thrive’s overall TradeCOMM score increased from 4.39 in 2018 to 4.80 in 2019 to 4.92 in 2020. The national mean score is 4.65.

Communication also marks the relationship of Thrive with its home buyers. Thrive Home Builders has a one-year limited warranty that includes a 90-day and 11-month warranty review and emergency care, as needed. “Approximately 30 days after closing we will schedule a follow up to address key maintenance points, answer any questions about the homes' features, and review any items that would be a warranty concern.

This touch point ensures that Thrive customers know we continue to be engaged in their home ownership experience and allows us to react quickly if there any issues to be addressed. The implementation of Punch List Manager has provided buyers with a way to submit their warranty requests electronically and receive followup emails.”

All of the homes in the Vitality collection will be constructed to the DOE Zero Energy Ready Home requirements that have helped Thrive earn these high customer satisfaction ratings by providing energy efficient, quiet, comfortable, durable, and healthy homes.

The walls of the grand award-winning home are double-walled, consisting of two 2x4 walls with studs set at 24 inches on center and staggered to further reduce thermal bridging between the outer studs and inner studs. Advanced framing details include 3-stud insulated corners, open and insulated headers, and ladder blocking at interior walls to provide 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.

The engineered truss roof is designed to maximize solar photovoltaic potential. It is sheathed in 7/16-inch OSB, covered with a 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 17 inches (R-50) of blown insulation.

The basement walls are protected on the exterior with a spray-applied waterproofing membrane and insulated along the inside with R-15 fiberglass batt in finished walls and R-19 perforated drape in unfinished areas. The insulated slab sits on a 4-inch base of clean gravel topped by a vapor barrier. A perforated pipe is installed in the gravel to collect radon and other soil gases and direct them to a vertical, fan-assisted stack, which vents the gasses through the roof.

The all-electric homes are equipped with a high-efficiency central heat pump that has a COP of 3.24 and a cooling efficiency of 17.8 SEER, with a variable-speed compressor, sealed ducts in conditioned space, and a MERV 13 filter.

Photos courtesy of Thrive Home Builders

KEY FEATURES

- **Walls:** Double wall, R-39 total: two 2x4 24" o.c. walls set 2.5" apart, advanced framed, 9.5" blown fiberglass, 7/16" OSB sheathing, drain wrap, engineered wood siding.
- **Roof:** Truss gable roof: 14" raised heel trusses, 7/16" roof sheathing, self-adhered membrane at eaves and valleys, 10-mil synthetic underlayment, 30-year asphalt shingles.
- **Attic:** Vented attic: 20" 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 with fan in 4" aggregate under 6-mil slab vapor barrier.
- **Windows:** Double-pane, argon-filled, low-e, vinyl frame, U=0.24, SHGC=0.2.
- **Air Sealing:** 1.80 ACH50, closed-cell spray foam top plates and rim joists.
- **Ventilation:** Continuous exhaust paired with fresh air supply; temperature and humidity sensors on fresh air intake. MERV 7 filter on intake. MERV 13 filter on supply.
- **HVAC:** Central air-source heat pump, 3.24 COP, 17.8 SEER, AC variable speed compressor.
- **Hot Water:** Heat pump water heater, 3.55 UEF, 65-gal; recirculation pump.
- **Lighting:** 100% LED.
- **Appliances:** ENERGY STAR dishwasher, clothes washer, clothes dryer, induction cooktop.
- **Solar:** 7.8-kW rooftop panels, 10-kW battery storage.
- **Water Conservation:** Low-flow fixtures, PEX piping: hot-water recirculation pump; smart irrigation.
- **Energy Management System:** Energy monitoring system, keypad camera.
- **Other:** Low/no-VOC paint, Green Label Plus carpet, KCMA-certified cabinetry, GreenGuard-certified hardwood flooring; prewired for EV charging.