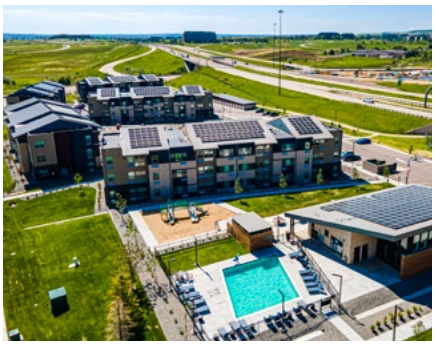
colorado affordable housing

Apex Meridian South Case Study | Englewood, Colorado



Project data

Project Location	Englewood, CO
Climate Zone	5
Housing Tax Credit	Federal 4 percent Housing Tax Credits
Placed in Service	2022
Project Size (sf)	197,715 sf
Floors (#)	3
Units (#)	208 (96 one-bedroom, 96 two-bedroom, 16 three-bedroom)
Buildings (#)	10
Construction Type	New
Fuel Type	All-electric
Green Building Certifications	2015 Enterprise Green Communities Certification, Energy Star MFNC
Total Development Cost	$37,000,000 (2022)
Operational Cost	Not Available

Overview

Apex Meridian South is an all-electric affordable housing development in Englewood and is the third Apex project completed by Shea Properties in the area. The development, which completed construction in 2022, built upon the successes of other nearby all-electric buildings Apex Meridian West (completed in 2014) and Apex Meridian East (completed in 2020).

Shea Properties pursued an all-electric approach for these projects for three reasons:

- It advances sustainability efforts
- Local officials encouraged more all-electric housing developments
- None of the sites had infrastructure to support natural gas hookups prior to development

The development features 208 affordable rental units across 10 buildings. The site is located in a suburb south of Denver, with access to E-470 and I-25 and near major shopping, dining, and employment opportunities.

Electrification strategies and features

Water Heating
Individual electric resistance water heaters

Space Heating
Individual packaged terminal heat pumps

Ventilation
In-unit exhaust-only ventilation

Cooking
Electric resistance stoves

Planning and design approach

Apex Meridian South focused their sustainability planning by using an integrative design process. Integrative design is an approach to pre-development that often features fast-paced design meetings called *charettes* that prioritize collaborative goal setting and multi-benefit strategy to achieve objectives.

The integrative design approach for Apex Meridian South identified several project goals: incorporation of design and features that support resident health and well-being; inclusion of amenities and access that would keep residents connected to the nearby community; and energy-efficient design. This is a village-style project that features access to neighborhood resources and the outdoors while maintaining excellent access to public transportation (rail, bus), parks, trails, and recreation opportunities.

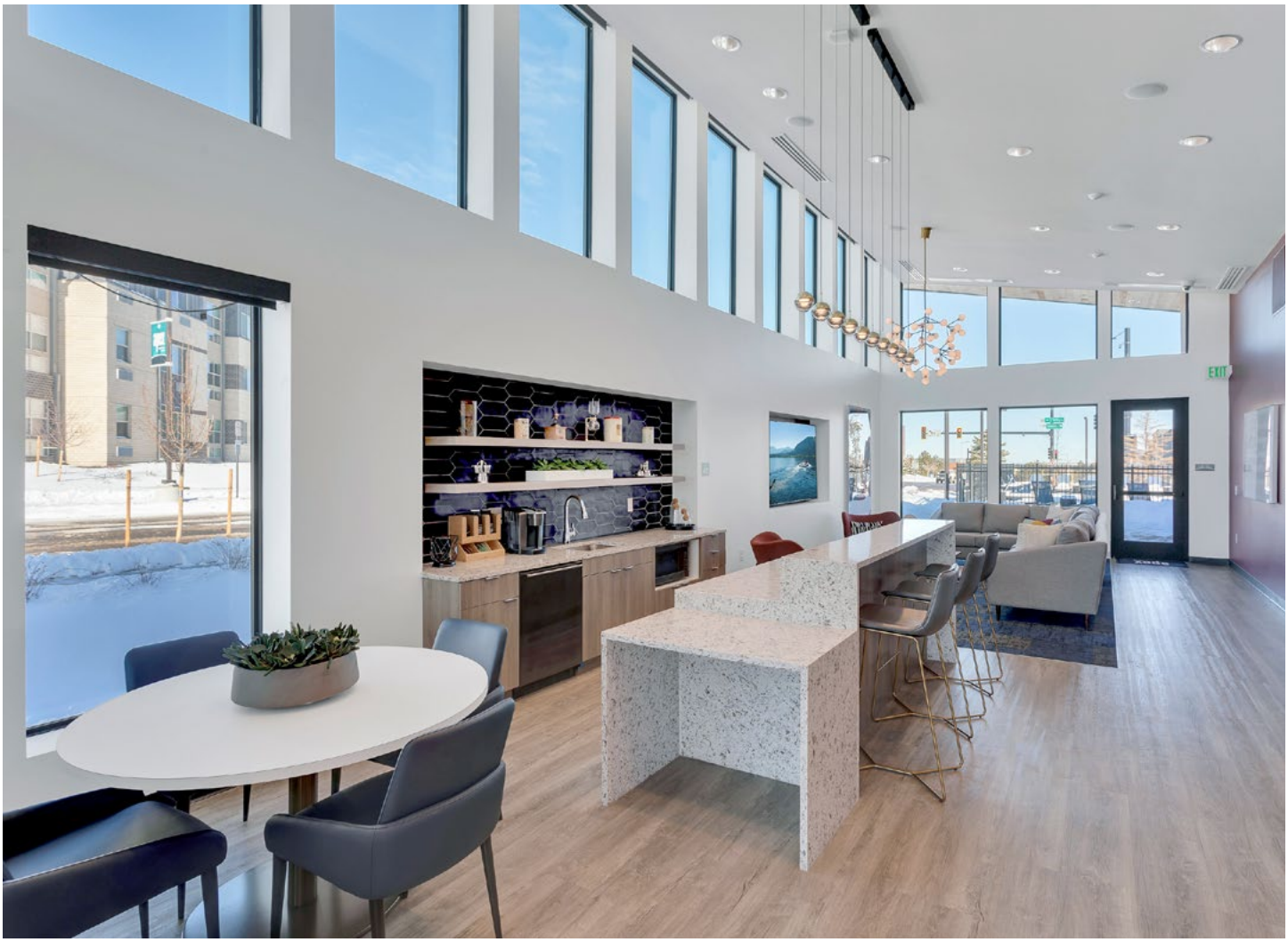
During the design development phase of the project, the team was unsure if solar photovoltaic (PV) panels would be financially feasible. To maximize their flexibility, Shea Properties asked their engineers to design solar-ready structural components so that the building could accommodate PV panels if they became financially viable. The team focused on best practice construction materials and methods to ensure the building would be as energy efficient as possible by prioritizing passive heating and cooling design strategies, envelope energy efficiency, efficient lighting design, and efficient mechanical system design.

As the project neared construction, the finances for renewables aligned and Shea Properties was able to quickly amend their design to include solar PV panels as part of the project.

Deciding to only use systems and appliances powered by electricity in Apex Meridian South was a straightforward decision for the team at the Shea Properties team, just as it was with their other two Apex Meridian developments. When each of these sites were developed, there weren't any natural gas infrastructure or hookups. Without this infrastructure in place, it was financially advantageous to commit to an all-electric development strategy.

Shea Properties sought to minimize first costs when selecting water heating, space heating, and ventilation systems for Apex Meridian South. Packaged terminal heat pumps (PTHPs) and electric resistance water heaters do often have a lower first cost compared to alternative electric HVAC systems, but the tradeoff is that these systems typically have a higher operating cost. This tradeoff—first cost versus operational costs versus performance—is one that developers should consider carefully when selecting systems. *To learn more about* **space** *and* ***water heating****, visit the* ***technical roadmap****.*

Apex Meridian South features onsite solar PV that generates enough kilowatts to offset energy use in common spaces, but not enough to offset energy used in the apartments. When the decision was made to incorporate onsite solar, a master meter was added to each building, followed by submeters for each unit. This is a common metering arrangement when a project has onsite solar. *To learn more about* ***solar*** *and* ***utility metering****, visit the* ***technical roadmap****.*



Financing and cost

The development of Apex Meridian South was financed through federal Housing Tax Credits and private activity bonds, with few soft funding sources. The total development cost (TDC) for Apex South was $37,000,000.

The integration of solar PV panels at Apex Meridian South became financially viable through the strategic allocation of remaining contingency funds. From the onset of the project, Shea Properties planned on maintaining robust contingency reserves within the budget to account for unforeseen costs. With no significant unexpected costs presenting themselves during the process, these reserved funds were reallocated to enable the inclusion of solar. As noted above, Shea Properties, the architect, and structural engineer had planned for this potential improvement and were ready and able to alter the design to include rooftop solar arrays.

Successes

The Apex Meridian South development was able to efficiently build upon the successes of the previous two Apex Meridian developments to deliver 208 units of affordable housing to the Denver Metro area. The project features all-electric mechanical systems and photovoltaic panels to offset energy usage for the project. Early planning by the team to use electricity instead of natural gas as an energy source made the design of the site simpler and also avoided costly installation of natural gas lines. While the MEP systems used in this project are some of the lowest-cost electric systems available, with increasing availability of contractors and installers skilled in electric MEP design and installation, Shea Properties hopes to leverage of more advanced systems which are both affordable to purchase and operate in future developments.

Lessons learned

There are several lessons learned from the Apex Meridian South project that are relevant to multifamily affordable housing developers in Colorado.

- While the space and water heating systems employed at Apex Meridian South – packaged terminal heat pumps (PTHPs) and electric resistance water heaters – was typical of ENERGY STAR certified properties in Colorado at the time of the design of this project, with rapidly updating building codes and programs, this approach may be unlikely to meet current building performance requirements.
- There is a lot of value in discussing a new development with local government officials. Many public officials are trying to solve the same problems that developers are—how to build more affordable housing as efficiently as possible and reduce emissions. Partners in local government may be able to reduce friction within the development process and identify new partnerships to support the success of the project.
- The affordable housing community in Colorado is largely supportive of multifamily building electrification when feasible and the industry of partners (installers, contractors, mechanical/systems engineers) are getting better at designing and installing these systems as demand is rising.

Project team

Developer	**Shea Properties**
Architect	**Ratio Design**
General Contractor	**Catamount Constructors**
Structural	**IMEG Corp.**
Civil	**Martin/Martin Consulting Engineers**
Mechanical, Electrical, and Plumbing (MEP)	**Belfay Engineering P.C.**
Energy	**Group14 Engineering**

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