

# Zero Energy, Smart Building Development



## One Developer Takes a Bite Out of Carbon and Can Prove It.

### The Gate, Frisco, TX

Petra Development is demonstrating how to build sustainable and resilient buildings that are designed to maintain performance for generations to come. The Gate development will bring much needed residential, commercial, retail and hotel capacity to Frisco while reducing environmental impacts of new buildings and improving occupant health and comfort.

Credit: Kirksey



### Owner's Project Goals

The developer set very high building performance expectations using building science and data science. The goals, embedded in the Owner's Project Requirements include environmental stewardship, occupant wellness and transparent/secure access to performance data.

#### Operating Carbon

- Site EUI of 14kBtu/SF/year representing the most cost-effective path to zero energy.

#### Occupant Health

- 0.35 air changes per hour, but not less than 15 cfm/person.

#### Embodied Carbon

- Use of off-site construction and mass timber reduces embodied carbon by as much as 60%.

#### Photovoltaic Arrays

- Secures the path to zero operating carbon.

#### Smart Building Infrastructure

- Open, integrated control systems utilizing an independent data layer (IDL).



### Project Highlights

The Gate project in Frisco, TX will not only be beautiful but will set the bar of performance for new buildings in the region. Utilizing passive building strategies ensures the most cost-effective and efficient route to zero operating carbon. The project expects to receive Passive House certification.

Utilizing mass timber and off-site construction drives the reduction of embodied carbon by as much as 60%. It's fair to believe that The Gate project will demonstrate one of the lowest overall carbon emissions levels of any new construction project in Texas and, perhaps across the United States.

Historically, buildings pursuing very low levels of energy consumption are forced to sacrifice the quality of indoor air. In the case of The Gate project, the team is simultaneously designing systems to provide world class indoor quality as demonstrated by RESET Air certification.

By establishing ownership and control over the performance data in the buildings, The Gate is equipped with the tools necessary to ensure the buildings maintain exceptional levels of performance for the next 50 years.

### New Construction & Renovation

Multi-Use Site with multiple buildings  
1,000,000 SF

### Project Team

AUROS Group  
Kirksey  
DBR Engineering  
Newcomb & Boyd

### Project Reference

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[petradevelopment.com](http://petradevelopment.com)

## Zero Carbon, Smart Building Development

### One Developer Takes a Bite Out of Carbon and Can Prove It

#### The Gate, Frisco, Texas

Petra Development is demonstrating how to build sustainable and resilient buildings that are designed to maintain performance for generations to come. The 5+ buildings Gate development will bring much needed residential, commercial, retail and hotel capacity to Frisco while reducing environmental impacts of new buildings and improving occupant health and comfort.

Credit: Kirksey



### Owner's Project Goals

- 1. Site Energy Use intensity: 14 kBtu/sf/year**
  - An efficiency-first strategy is the only way to ensure the highest performing building at the lowest cost
  - Passive House (PHI) Certified
- 2. Renewable energy**
  - Right-sized photovoltaic arrays secure the path to zero energy
- 3. Embodied Carbon**
  - Mass Timber
  - Offsite Construction
- 4. Community Planning, Five (5) Buildings**
  - Over 1 million square feet of development



### Supporting Documentation

- 1. Lowest energy consumption level achievable using building science with the following benefits:**

- o Lowest cost approach to zero energy.
- o Slashes the cost of energy for the life of the building.

Source: <https://www.weforum.org/agenda/2021/01/passive-housing-sustainable-emissions-reduction/>

- 2. Efficiency: The First Renewable Energy**

<https://www.treehugger.com/efficiency-the-first-renewable-energy-5184220>

- 3. Embodied Carbon**

- o Mass Timber: designing with wood over steel reduces embodied carbon by up to 75%.

<https://passivehouseaccelerator.com/articles/addressing-embodied-energy-with-mass-timber>

- o Offsite Construction: offsite construction and/or modular construction reduces carbon emissions during construction in excess of 40%.

<https://eandt.theiet.org/content/articles/2022/06/modular-construction-technique-slashes-carbon-emissions-from-new-buildings/>

### New Construction

Mixed-Use Site with multiple buildings

Over 1,000,000 SF

### Project Team

AUROS Group

Kirksey

DBR Engineering

Newcomb & Boyd

### Project Reference

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