

Welcome to the future of eco-friendly living with our cutting-edge geothermal technology home. Imagine a residence where sustainability meets comfort, where your energy bills shrink while your comfort soars.

This home harnesses the Earth's natural heat to provide efficient heating, cooling, and hot water, reducing your carbon footprint while keeping you cozy year-round.

Introducing the pinnacle of modern living: our eco-conscious home starts with our state-of-theart open- loop geothermal systems. Step into a world where old world charm, meets contemporary comfort enhanced by renewable sustainability, where every corner is embraced by warmth in the winter and cool relief in the summer.

First, the home's envelop is meticulously crafted with closed-cell spray foam insulation ensuring unparalleled energy efficiency and airtight protection against the elements.

But that's just the beginning. With our innovative open-loop geothermal system, we harness the Earth's endless renewable energy source to provide efficient heating and cooling like never before. Experience the luxury of consistent temperatures throughout your home, all while reducing your environmental impact and enjoying significant cost savings.

This is enhanced by our engineered designed <u>radiant floor-heating</u>, where every step is a delight on warm, toasty floors in the winter, and cool relief in the summer.

We continue our journey towards a healthy, environmentally-safe lifestyle with our <u>4 stage</u>, <u>commercial- grade water purification system</u>, ensuring that every drop that flows through the entire house is pristine, refreshing, and free from impurities. Say goodbye to concerns about water quality (hard water or stained bathroom fixtures) and hello to peace of mind, knowing that your family's health and well-being are top priorities.

And when it comes to outdoor spaces, our commitment to sustainability shines through with our <u>well-water irrigation system</u>. We harness the natural bounty beneath the Earth's surface by providing the garden and landscapes with a constant supply of nourishing water, all while minimizing strain on municipal resources and reducing your environmental footprint.

Welcome home to a sanctuary where comfort and health intertwine seamlessly with renewability and sustainability.



### <u>Geothermal system (Open-Loop) – by WaterFurnace,</u> <u>Envision Series, two-10 ton Heat Pump system</u>

Step into a world of sustainable luxury with open loop geothermal cooling and heating – the epitome of eco-friendly comfort. Experience the harmony of nature and technology as this cutting-edge system taps into the Earth's renewable energy to effortlessly regulate your home's temperature year-round. Say goodbye to traditional HVAC systems and hello to unparalleled efficiency and cost savings. With open loop geothermal, every season is perfect – from cozy winters to refreshing summers, you'll enjoy consistent comfort without compromising on your commitment to the environment.

An open loop geothermal system, also known as a *groundwater heat pump system*, is a type of geothermal heating and cooling system that utilizes groundwater as a heat exchange medium. Here's how it works:

**1. Extraction of Groundwater**: In an open loop system, groundwater is extracted from a well or other water source using a pump.

**2. Heat Exchange**: The extracted groundwater is then circulated through a heat exchanger, also known as a heat pump, which is typically installed inside the building.

**3. Heat Transfer**: As the groundwater passes through the heat exchanger, it transfers its thermal energy to the refrigerant inside the heat pump. In the winter, this heat transfer process warms up the refrigerant, which is then compressed to increase its temperature. In the summer, the process is reversed to cool the building.

**4. Distribution**: The heated or cooled refrigerant is then circulated through the building's heating and cooling system, such as radiators, underfloor heating, or air ducts, to provide indoor comfort.

**5. Return to Groundwater**: After exchanging heat with the building's heating and cooling system, the groundwater is discharged back into the ground, typically through a separate well or discharge pipe.



Open loop geothermal systems offer several advantages, including high efficiency, low operating costs, and environmental sustainability that this home has. Discover the pinnacle of modern comfort with Geothermal Cooling and Heating – your pathway to a sustainable, energy-efficient home. Harnessing the Earth's natural energy, this innovative system provides year-round climate control with unparalleled efficiency.

Say goodbye to fluctuating energy bills and hello to consistent comfort, as Geothermal technology delivers reliable heating in the winter and refreshing cooling in the summer, all while reducing your carbon footprint. With quiet operation and minimal maintenance, enjoy peace of mind alongside luxury living. Embrace the future of home comfort with Geothermal Cooling and Heating – where sustainability meets superior performance, creating a haven of wellbeing for you and your family.

# **Radiant Floors – by Warm board Radiant Floor Heating Systems**

Step into a world of luxurious warmth with radiant heating floors – the epitome of comfort and sophistication. Transform your home into a cozy retreat where every step is a delight, as gentle warmth emanates from beneath your feet. Say goodbye to chilly mornings and hello to the indulgent pleasure of heated floors, providing consistent comfort without the need for bulky radiators or vents.

With radiant heating, you'll experience even heat distribution throughout your space, creating a blissful oasis of comfort in every room. Elevate your living experience and embrace the ultimate in-home luxury with radiant heating floors – where warmth meets elegance for a truly transformative lifestyle.

Radiant in-floor heating, is silent, invisible, and energy-efficient. They also distribute heat evenly throughout your home, so you'll always be comfortable. Radiant floor heat is a specific



application of radiant heating, where the hydronic heating system, is installed beneath the floor of all rooms and common areas throughout the house.

In the in-floor radiant heating distribution system, the Warm board-R radiant floor heating panels have been installed over existing subfloor and with the custom PEX hot water tubing embedded within the floor structure generate heat throughout the radiant heat panels that warm surface of the floor radiates heat upward, conditioning the space, warming the objects and people in the room, creating a comfortable and evenly distributed warmth throughout the space.

Here are just a few of the benefits of radiant floor heating:

- Energy efficiency: Radiant floor heating systems are up to 30% more energy-efficient than forced hot air systems. This means you'll save money on your heating bill every month.
- **Comfort:** Radiant floor heating warms your body directly, so you'll feel comfortable even at lower temperatures.
- **Health:** Radiant floor heating systems don't stir up dust and allergens like forced hot air systems do. This is ideal for people with asthma or allergies.
- Quiet: Radiant floor heating systems are silent, so you won't be bothered by the noise of a blower fan.

### High efficiency modulating condensing boiler – by Lochinvar, Knight Series

Introducing the cornerstone of modern heating efficiency – our High Efficiency Modulating Condensing Boiler.

Engineered to redefine comfort and sustainability, this cutting-edge system is designed to elevate this home's heating performance to new heights.

Say goodbye to energy waste and hello to optimal efficiency as our boiler intelligently adjusts its output to match your heating needs in real-time, maximizing comfort while minimizing fuel consumption.



With its condensing technology, every ounce of energy is harnessed, ensuring that no heat goes to waste. Experience unparalleled reliability and peace of mind with a boiler that not only delivers exceptional performance but also reduces your carbon footprint, contributing to a greener tomorrow where comfort meets conscience for a brighter, more sustainable future.

Here's a breakdown of its key features:

**1. High Efficiency**: These boilers are engineered to achieve high levels of energy efficiency by extracting as much heat as possible from the fuel source, typically natural gas or propane.

**2. Modulating**: Unlike traditional boilers that operate at a fixed output, modulating boilers can adjust their heat output in real-time based on the heating demands of the building. This modulation ensures that the boiler is always providing just the right amount of heat, optimizing comfort while minimizing energy consumption.

**3.** Condensing Technology: Condensing boilers are designed to capture and utilize the latent heat contained in the flue gases that would otherwise be lost in traditional boilers. By condensing these gases into liquid form, more heat is extracted, further increasing efficiency.

**4. Intelligent Control**: These boilers often feature advanced control systems that can monitor and adjust various parameters, such as water temperature and flow rate, to optimize performance and efficiency.

**5. Reduced Carbon Footprint**: By maximizing energy efficiency and minimizing fuel consumption, high efficiency modulating condensing boilers help reduce greenhouse gas emissions, contributing to a more sustainable environment.

Overall, the high efficiency modulating condensing boiler represents the latest in heating technology, offering superior performance, energy savings, and environmental benefits.

Enjoy unrivaled comfort and savings as this cutting-edge system efficiently adjusts to your heating needs, ensuring optimal warmth while minimizing energy consumption.

Coupled with our Squire – Indirect Water Heater Tank, you'll have an endless supply of hot water

Thermostatic Controls – powered by NEST



# <u>Spray foam closed cell insulation – by Owens Corning</u>

Introducing the ultimate solution for insulation excellence – spray foam closed cell insulation. Its closed-cell structure not only enhances thermal resistance but also reinforces structural integrity, providing unparalleled durability for years to come. Experience the epitome of this home's comfort and energy savings with spray foam closed cell insulation – where every inch is meticulously sealed for maximum performance and peace of mind.

Spray foam closed cell insulation is a type of insulation material used in buildings to enhance energy efficiency and thermal performance. Here's an overview of its characteristics and benefits:

**Composition**: Closed cell spray foam insulation is typically made from a mixture of polyurethane and other chemicals. When applied, it expands and hardens to create a dense, closed-cell structure.

**High R-Value**: Closed cell spray foam insulation has a high R-value per inch compared to other types of insulation. This means it provides excellent thermal resistance, helping to keep indoor spaces warm in the winter and cool in the summer.

Air Sealing: One of the key benefits of closed cell spray foam insulation is its ability to seal gaps and cracks in walls, ceilings, and floors. This prevents air leakage, which can significantly reduce heating and cooling costs and improve indoor air quality.

**Moisture Resistance**: Closed cell spray foam insulation is resistant to moisture infiltration, making it suitable for use in damp or humid environments such as basements or crawl spaces. It can also help prevent mold and mildew growth.

**Structural Strength**: The dense structure of closed cell spray foam provides added structural stability to buildings. It can help reinforce walls and roofs, making them more resistant to wind, earthquakes, and other external forces.

**Longevity**: Closed cell spray foam insulation is durable and long-lasting, with a lifespan of 20 years or more when properly installed and maintained.



### <u>Commercial Grade Water Purification System</u> <u>- Pentair 4 Stage System</u>

Introducing the pinnacle of water purity– our state-of-the-art Commercial Water Purification System.

Engineered for efficiency and reliability, our system employs advanced filtration and purification technologies to remove contaminants, chemicals, and impurities, ensuring the highest standards of water quality for your staff, customers, and clients. Say goodbye to concerns about waterborne pathogens or unpleasant tastes and odors – our Commercial Water

Purification System guarantees peace of mind and unparalleled water purity. Setting the standard for excellence in hydration and sustainability.

This system is engineered to remove impurities, contaminants, and other undesirable substances from water, ensuring it meets the required quality standards for various purposes. Here's an overview of the components in our water purification system:

**1. Pre-Treatment**: The water undergoes an initial pre-treatment processes which includes sediment filtration and activated carbon filtration to remove suspended solids, organic matter, chlorine, and other substances that could interfere with subsequent purification stages.

**2. Primary Purification**: The water then passes through multiple purification tanks such as reverse osmosis (RO), ultrafiltration (UF), nano-filtration (NF), and distillation to remove dissolved solids, salts, heavy metals, microorganisms, and other contaminants. The purification employs membranes, filters, and distillation processes to achieve high-quality water.

**3. Water Polishing & Disinfection**: After purification, the water passes through a final disinfection and polishing filtering treatment and dichlorination to eliminate any remaining .5 micron level ensure water quality safety.

**4. Storage and Distribution**: Purified water is stored in tanks or reservoirs before being distributed through a network of pipes, pumps, and valves to various points throughout the house. Some systems may also incorporate distribution loops or recirculation systems to maintain water quality and prevent stagnation.



## <u>Well Water Irrigation – Open-Loop submersible pump - powered by</u> <u>Pentair, Pentek Intellidrive</u>

Welcome to your oasis of sustainable living – where pristine well water meets lush, vibrant landscapes. Nestled within this serene sanctuary is a home adorned with well water irrigation, marrying eco- consciousness with the beauty of nature. Picture yourself strolling through flourishing garden, nourished by crystal-clear water sourced from your very own well. With every drop meticulously purified by nature itself, your outdoor oasis thrives without compromise, all while conserving precious resources. Bid farewell to costly city water bills and hello to self-sufficiency, as your well water irrigation system transforms your landscape into a picturesque haven of greenery. Embrace the harmony of sustainable living and natural beauty in your well-watered paradise – where every garden grows, and every moment blossoms with life.

The well water irrigation uses water from your well as a source for watering plants, garden and landscaping. Here's how it works:

- 1. Well: existing well water supplies our house irrigation system.
- 2. **Distribution System**: the well water is distributed to the irrigation system through pipes and hoses of the house and gardens. The distribution system is controlled by valves, filters, and pressure regulators to control the flow and ensure proper irrigation coverage.
- 3. **Application**: Well water irrigation is used for the landscaping and gardening to provide plants with the necessary moisture for growth and development.
- 4. Water Management: The automatic controller well water system ensures management of water use per aground area.



## <u>Supplemental ground drainage system</u> <u>– powered by Liberty Pumps system</u>

**Stage 1** – Liberty Drain Pump - Enhanced supplemental drainage system (ground floor rear yard) that engages when the two 40 gallon dry-wells in the rear patio are full. The zipper trench drain located by the glass doors are connected to a 1/2 hp enclosed sump pump that run into the separate in-house storm line leading to the NYC sewer main.

**Stage 2** – Liberty Sump Jet - In the event of a power failure, a backup pumping system engages, powered by kinetic energy (water pressure) to discharge water accumulated in the cellar and directed out of the house.

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