Engineering progress
Enhancing lives

Sleep Hollow, NY Private Residence

Radiant contractor's dream home employs the unmatched comfort of radiant.
na.rehau.com/projects

REHAU

New York dream home has it all: Chic design, spectacular views and the unmatched comfort of a REHAU radiant heating system.

Overlooking the Hudson River near the Village of Sleepy Hollow, NY, sits a new, 3,000 sq-ft (279 sq-m) home worthy of the cover of Architectural Digest.

This dream home, in the New York City suburb of Legend of Sleepy Hollow fame, came to life after homeowners Peter and Gina Gasperini spent years planning and deciding on their "must haves." Near the top of that list was a radiant heating and snowmelt system from REHAU.

The Gasperinis aren't the average customer when it comes to radiant heating; they've been in the business for years. So they knew exactly how the REHAU radiant system would provide the level of comfort befitting the home of their dreams.

"Through our business, we've worked with many homeowners who understand that there's more to creating a dream home than just design and aesthetics," said Peter Gasperini, whose Pleasantville, NY-based company, Northeast Radiant, specializes in radiant heating and plumbing systems.

"It doesn't make sense to invest significant time, money and effort designing a higher-end home and then skimp on HVAC, or toss in a standard forced-air system as an afterthought," said Gasperini. "The indoor climate system should be on par with the rest of the home; otherwise you've made a major compromise."

The Gasperini's 3-level contemporary features an "upside down" style of living custom-designed by New York architect John Whalen. The home has an open floor plan with living areas, including the kitchen, dining and family room, on the second level and bedrooms on the first level. At ground level is the garage and finished basement. Walls of windows across the front and west side of the home capture the spectacular views of the Hudson River and Tappan Zee Bridge.

Radiant technologies allow for targeted design and installation
For the living areas and bedrooms, the Gasperinis chose a RAUPANEL radiant system, consisting of 3,000 ft (914 m) of 3/8 in. crosslinked polyethylene (PEXa) pipe laid in aluminum panels installed between the subfloor and flooring material.

"My company was one of first contractors to use RAUPANEL soon after it hit the market in the early 2000s," Gasperini said. "We've worked with all of the different radiant systems out there, and there's none better than REHAU. It's very efficient, you don't see it…and you feel so comfortable you don't even think about it."

To heat the ground-level and garage, 1,800 ft (549 m) of 1/2 in. pipe was fastened to rebar on top of a thermal break insulator. Then the concrete slab was poured, polished and sealed. This method of installing radiant is very cost effective and provides a beautiful, durable finished floor.

Experience leads to efficient design

Gasperini used his years of experience as a radiant contractor when designing the mechanical and plumbing systems. "I always try to make my radiant systems as simple to install and service as possible, while also providing exceptional efficiency. This saves on materials and controls operating costs," he said.

A high-level overview of the sequence of operations is: Start-up > Plumbing > Radiant > SIM > Towel Bar > Shutdown. With heat supplied by two boilers, plumbing and radiant are primary and SIM and the heated towel bar are secondary.

Heat precisely tailored to radiant and towel bars
While the system may seem complicated, Gasperini curated a simple selection of components to supply both the radiant heating system and the heated towel bars.

- A Grundfos variable speed hi-efficiency circulator serves the 6 radiant zones and is capable of running all zones at once or only those in operation, providing the perfect flow in any situation.
- The Lochinvar boiler is equipped with a smart control that knows if the call is for radiant or the heated towel bars and dispatches the water at the appropriate temperature for the call. This feature eliminates the need for an expensive, stand-alone control system.
- An Oventrop three-way thermostatic mixing valve is set at the maximum water temperature for the radiant heating system. The valve prevents higher temperature water meant for the heated towel bar from entering the radiant system, which could exceed the recommended floor surface temperature.

Dedicated SIM boiler serves double duty
A second boiler supplies the SIM system, eliminating more complicated piping arrangements, extra pumps, heat exchangers and labor. Since the SIM boiler would be needed only a dozen or so times per year, Gasperini decided to enlist it for domestic hot water production as well.

The master bath includes an oversized tub and shower with multiple showerheads. When combined with the two additional showers in the home, the domestic hot water demands can be considerable. "Pairing the 200,000 Btu boiler with an 80-gallon indirect storage tank provides tons of hot water when needed," said Gasperini.

Are two boilers overkill?
Gasperini doesn't think so. He explained that having a boiler focused only on the radiant heating system maximizes operating efficiency. Especially in a new home as well-insulated as his, the radiant system is set to operate at moderate water temperatures. Without needing to service high-temperature DHW, the radiant boiler operates at a lower temperature and therefore a lower cost.

Snow and ice melting makes snow fun again

During a typical New York winter, snow and ice are a regular factor and can pose problems if not dealt with right away. The Gasperinis chose a REHAU snow and ice melting (SIM) system for both safety and convenience. The system comprises 1,500 ft (457 m) of 3/4 in. RAUPEX pipe installed under the concrete pebble-finish driveway and in the 16 bluestone steps, landing and entry leading to the home's front entrance.

Regulating the 38 pipe circuits of the radiant and SIM systems are eight PRO-BALANCE manifolds, including one for a towel warmer in the master bath and laundry. The heat source is two Lochinvar KNIGHT fire-tube, wall-mounted boilers and a Squire 80-gallon indirect water heater with Grundfos MAGNA variable-speed circulators, Spirovent air/dirt separators, Honeywell high-flow zone valves (10cv), Tekmar zone managers, Tekmar 670 WiFi snow melting control and Tekmar 090 snow and ice sensor.

As soon as snow or ice begins to develop, the system kicks in automatically to clear outdoor surfaces quickly and efficiently.

"We love not having to shovel or pay a contractor for snow removal, and also not having to worry about the potential hazard of slippery steps," Gasperini said. "We're actually able to truly enjoy a snowfall."

After being in the home for three winters, the Gasperinis agree that REHAU systems help make their dream home all they imagined: Comfortable, peaceful and safe.

Project: Private residence, Sleepy Hollow, NY
Construction Type: Single family residence, new construction
Project Scope: 6,300 ft (1,920 m) of RAUPEX pipe
Architect: John Whalen
General contractor: Northeast Radiant
Mechanical contractor: Northeast Radiant
REHAU systems used: RAUPANEL™ radiant heating, snow and ice melting (RAUPEX® pipe, PRO-BALANCE® manifolds)