THERMA-HEXX

Modular Heating and Cooling Systems

THERMA PANEL™

Dutchess County, NY - Pool House

Changing the way the world heats and cools its environments

THERMA PANEL™

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Solves exterior surface heating and cooling problems

ThermaPANEL is a patented modular hydronic heat exchange system that efficiently heats or cools pedestal and ground mounted pavers.

It is compatible with segmented pavers or stone of any type, pervious and impervious pavements, as well as all types of decking.

Full support of ground mounted pavers by the ThermaPANEL units prevents settling unlike PEX tube systems.

Ground mount installations require 1/2” - 1” of sand between the paver and panel. Pedestal mounted ThermaPANEL units are set in direct contact with the paver.

Snow and Ice Melting
Radiant Heating and Cooling

In heating mode, warm fluid (glycol) from a boiler or heat pump is circulated through the system, providing efficient, even, snow and ice melting of pedestal or ground mounted pavements and surfaces.

Outdoor spaces can be radiantly heated or cooled for a comfortable and safe environment.

In cooling mode, fluid from a pool heat exchanger, geothermal loop or chiller is circulated through the panels thus collecting thermal solar energy.

Trimmable panels can be cut to fit odd shaped areas.

Traditional boilers, modulating condensing boilers, geothermal heat pumps or captured waste heat and can be used to heat the fluid.

Each panel is permanently marked with its section, zone and row number, and installer contact number, for easy installation and system trouble shooting.

Panels can be easily replaced without shutting down the entire system.



Solar Thermal Pool Heating
Patio Surface Cooling

Thermal solar energy collected in the pavement surface can be captured by the ThermaPANEL units located under the pavement and used to heat domestic or pool water. Removing the energy will cool the surface at the same time.

Residual energy in the pavement can be collected at night to provide additional heat for the pool or other uses.

As energy is removed from the pavement, the pavement cools to provide a comfortable patio environment and reduced urban heat island effect.

Chillers, pools or a ThermaPANEL geothermal array can provide additional cooling to the pavement surface.

Manual, automatic or integrated building management controls can be used for system operation.

Therma-HEXX engineers provide the system design, engineering, layout and installation training for the architect, engineer and installer.

Product Specifications

Dimensions:
23.375” x 23.375” x 1.375” Full Panel
23.375“ x 23.375” x 1.375“ Trimmable Panel
(Trimmable to 23.375” x 12.75” x 1.375“)
23.5” x 11.5” x 1.375” Half Panel
23.5” x 23.5” x 1.375” Filler Panel
Panels are 3/8” thick when mounted on pedestals.
1” EPS insulation extends beneath top of pedestal.
Ground mounted Panels are 1.375” thick, edge to edge.

Material:
Bimodal Copolymer of LLDPE and HDPE PE-RT 2499
ASTM F2623

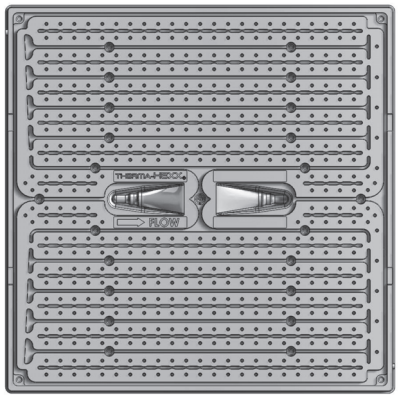
Fluid capacity:
Approximately 0.26 US gallons / full panel
Amount varies with interconnect configuration

Maximum operating temperature / pressure:
30 PSI @ 140 degrees F (or as marked on panels)

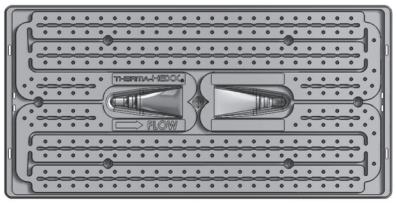
Recommended system static (resting) pressure:
10-15 psi

Maximum panels per row:
24 (48 lineal ft / 96 sq ft)

Connections:
Socket Fusion, Push on connectors, Crimp, Compression
ASTM F1807 - F2159 - D2683



Full / Trimmable Panel



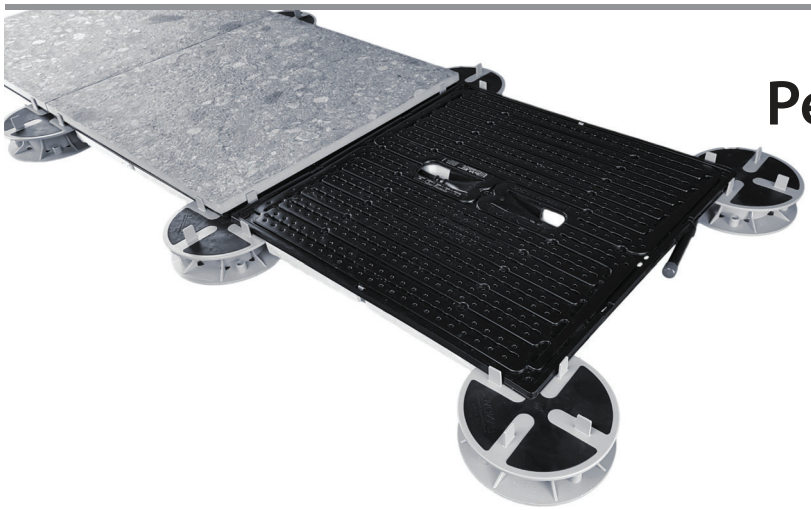
Half Panel

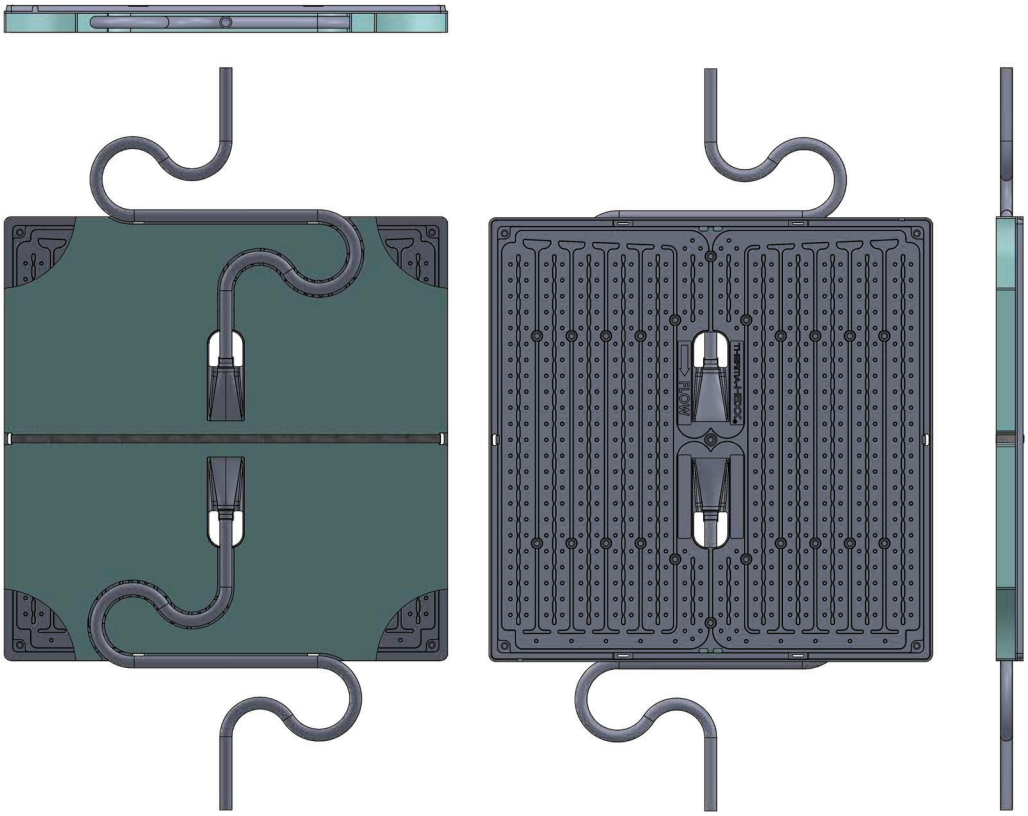
Permeable Protective Panel

25 year limited warranty
100% made in the U.S.A.
Recyclable

Master Spec Section 32-17-43 Pavement Snow Melting Systems

Pedestal Mount Details



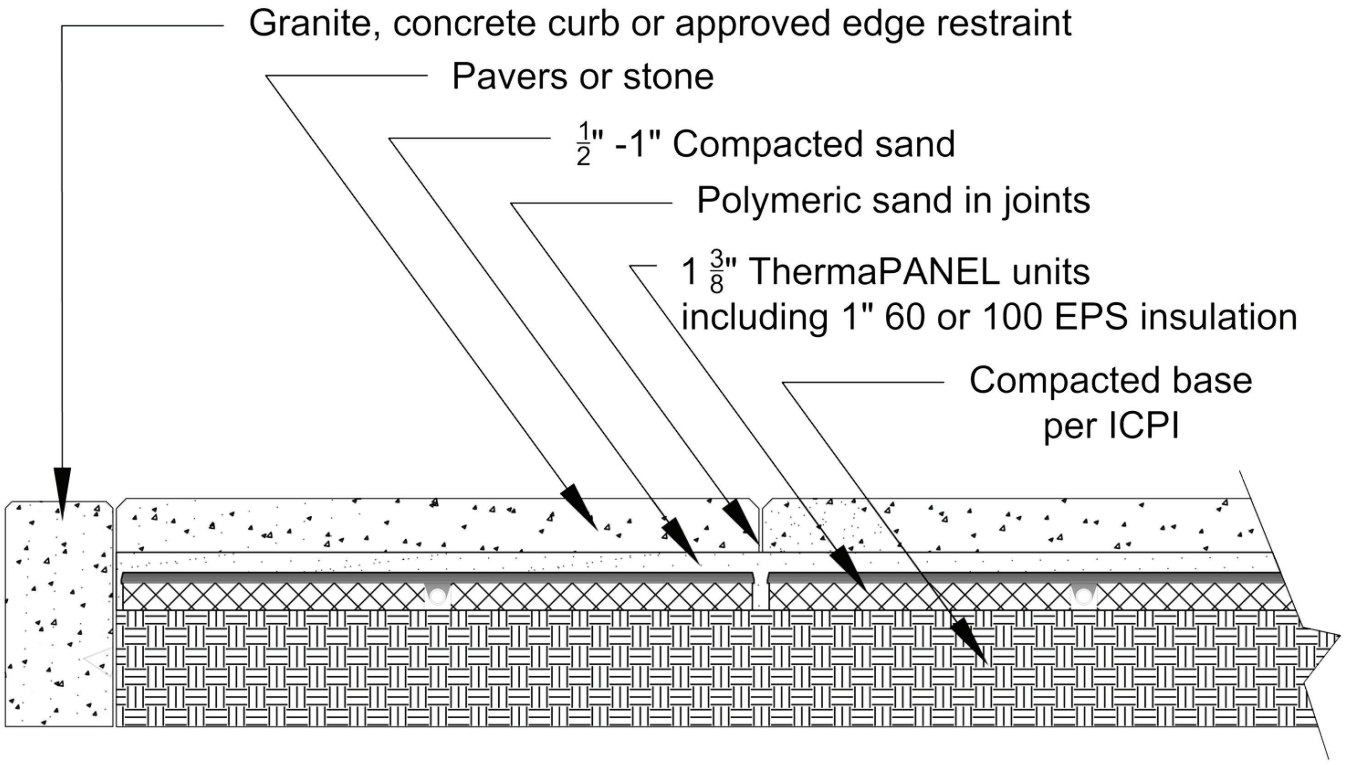


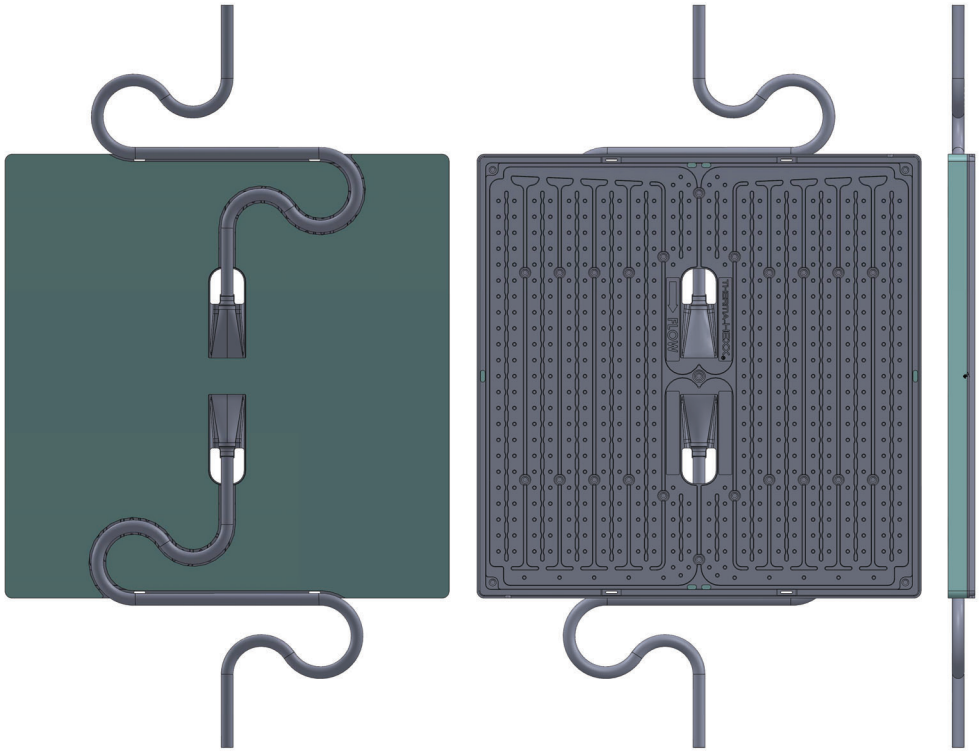
Pedestal mounted pavers typically lay out on either a 24” or 23-5/8“ grid. ThermaPANEL can be laid out on 23.5” to 26” centers on pedestals.

Other sizes can be accomodated by using an FRP support system beneath the ThermaPANEL units or with additional pedestals.

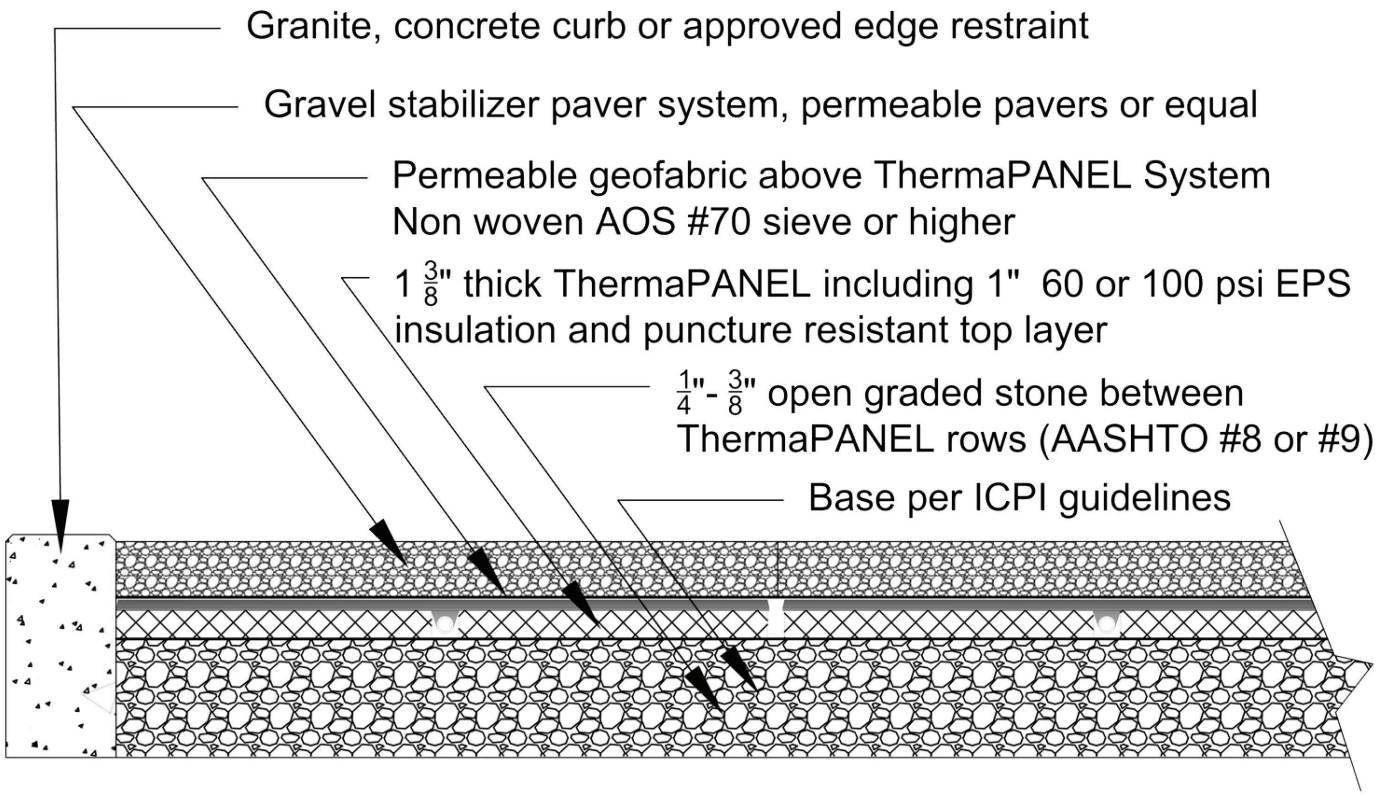
Manifolds and piping can be routed and placed in the plenum between the panels and the supporting surface.

Ground Mount Details





Permeable Ground Mount Details



This configuration is used where permeable surfaces are required.

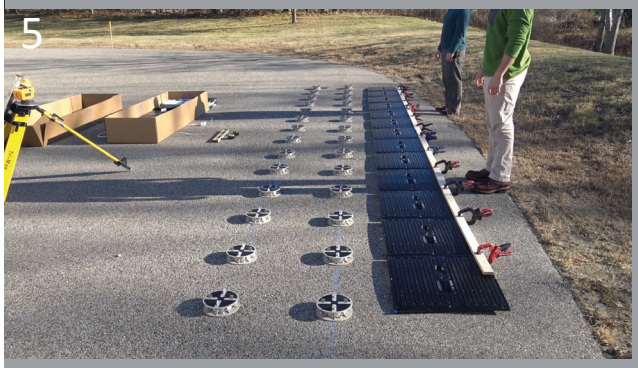
Variable sized permeable paving units that do not match the size and layout of the ThermaPANEL units can be utilized.

Permeable gravel stabilization systems can be used where a gravel or grass surface is required.

#70 Non woven geofabric is placed on the top of the ThermaPANEL units.

The ThermaPANEL units have an HDPE double top layer to prevent the gravel from abrading and puncturing the ThermaPANEL units.

Unpacking and Placement - Pedestal Mount



Installation Process - Pedestal and Ground Mount

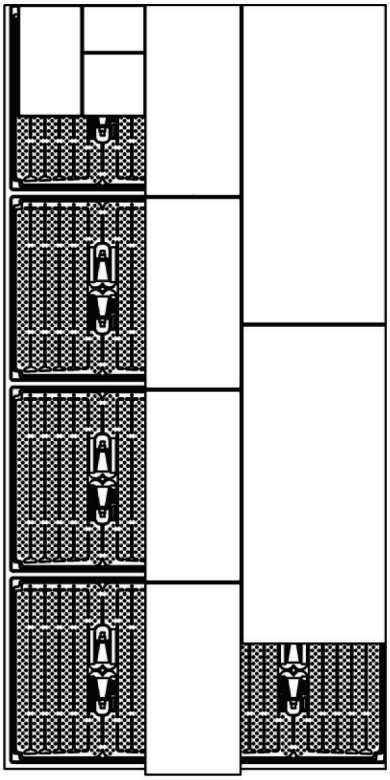
1) Review the supplied plans.
Each panel's section, zone and row are permanently printed into the panel as well as the contact info of the installer and Therma-HEXX.
2) Stage the boxes onsite - Each box is labelled with section, zone and row numbers of the contents on each side for easy identification.
3) Layout a square grid with chalklines. Set and level the first row of pedestals.
4) Unpack the row and and determine the supply and return ends of the row.
5) Orient and unfold panels in the proper direction of flow as noted on plans.
6) Clamp 1x3 strapping to each panel with one clamp at the panel corner.
7) Pick up and carefully place the row on the pedestals. Remove the clamps.
8) Re-adjust the pedestals on the grid lines.
9) Connect the supply and return to manifolds using the supplied tubing and connectors. Use PEX cinch, crimp, push on or fusion weldable fittings.
10) Pressure test each row to 30psi as they are installed.
11) Set the pavers on top of the panels, adjust spacing and level.
12) Set the next row of pedestals and level them.
13) Repeat 4 - 11 until complete.

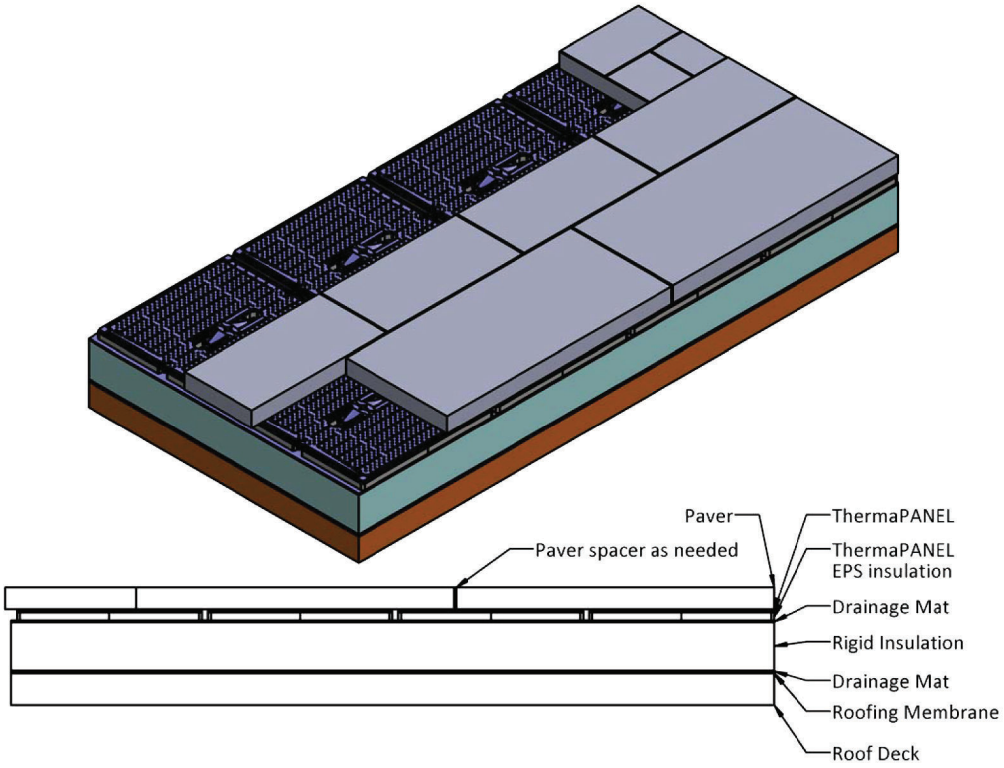
Trimmable panels are supplied and noted (T) where applicable. 10.5"of the panel can be trimmed to fit using any type of saw. No fusion welding is required. One half of the trimmable panels are inactive.

Insulated filler panels are supplied as noted (F) on plans where applicable and are inactive. They are supplied with 20" wide aluminum flashing which is to be trimmed onsite to cover the nearest active panel and the filler panel. The aluminum is placed on top of the panels before the pavers are set. This will provide heat transfer to or from the filler paver the nearest active panel.

For ground mount, simply unfold rows in the appropriate location making sure to maintain proper flow direction and orientation.

Flat Roof Solid Build Up Details





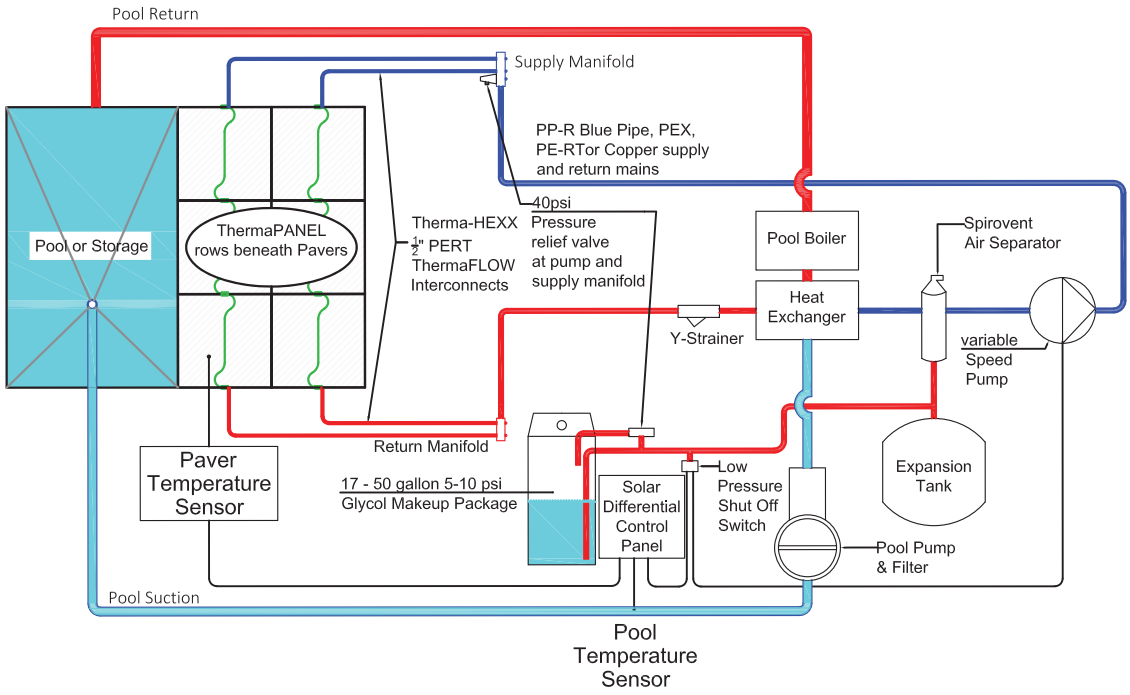
This configuration can be used on roofs that are level and flat. Pedestals are not required.

Variable sized paving units that do not match the size and layout of the ThermaPANEL units can be utilized.

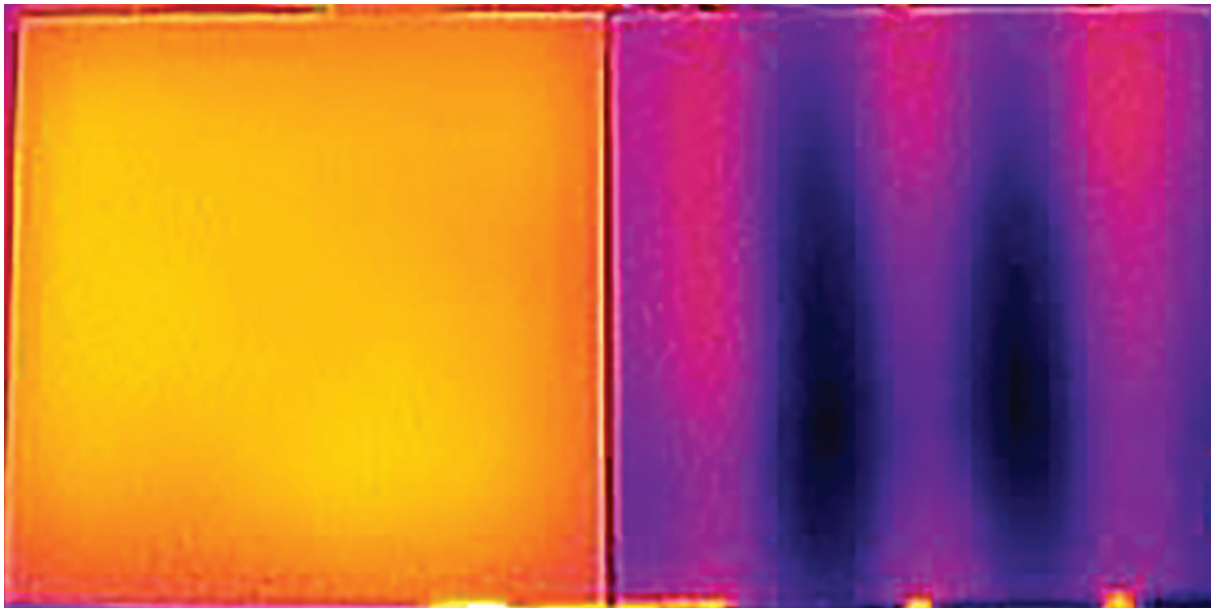
Drainage mat is placed between the insulation filler layer and the roof and between the filler layer and the ThermaPANEL units.

Adhere to roofing membrane manufacturer requirements for final design and warranty considerations.

Pool Heating / Patio Cooling Schematic

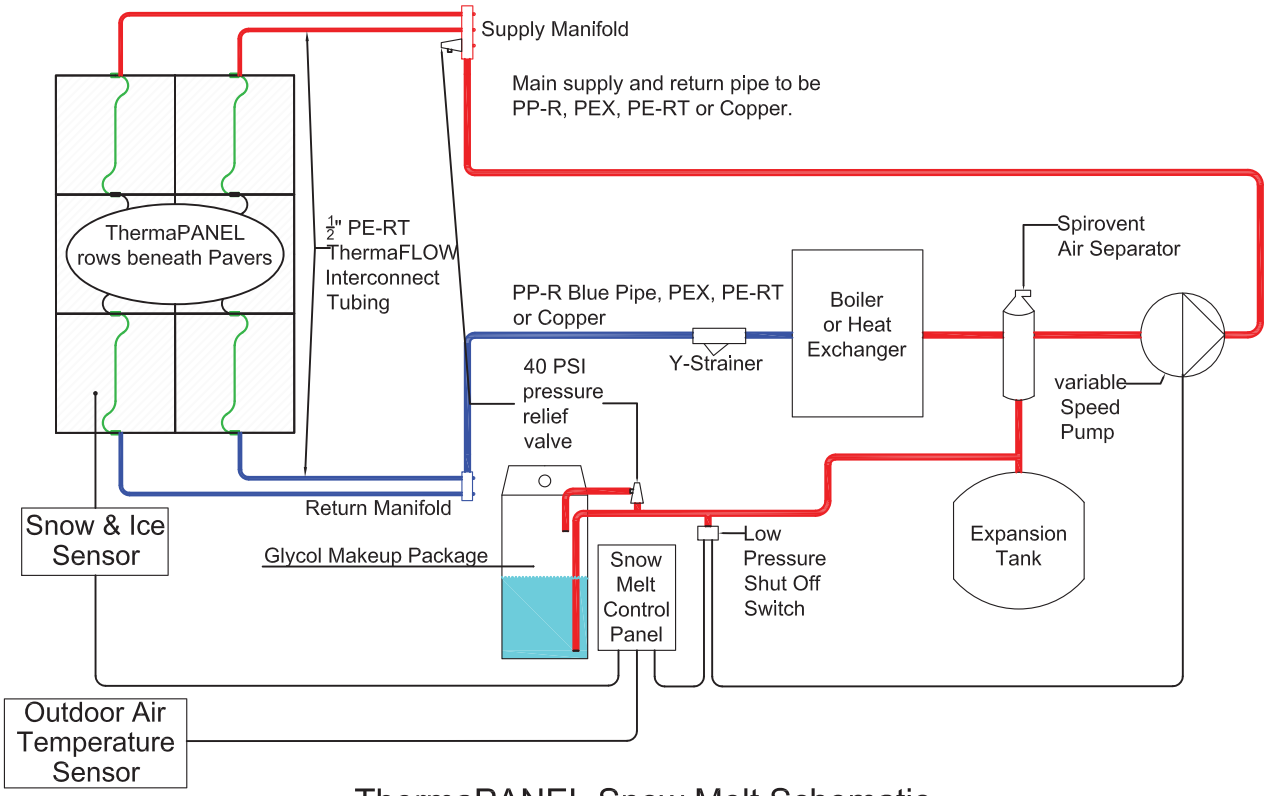


ThermaPANEL Solar Pool - Domestic Water Heating / Patio Cooling Schematic



Flir image, side by side, ThermaPANEL vs PEX tube, paver heating, performance comparison. ThermaPANEL transfers 250% more energy, evenly , per square foot per hour than the tube side.

Snow Melting Schematic



ThermaPANEL Snow Melt Schematic

Visit www.therma-hexx.com for CAD details, videos, testimonials specifications and detailed application information.

Or call us to discuss your project.
(603) 319-8815 Opt. 1

United States Patent No. 8,944,146
German Patent No. 21 2012 000 104.2
Australian Patent No. 2013101504
Canada Patent No. 2,837,373
Mexico Patent No. MX/a/2013/013721

Owner Responsibility

Dear property owner,

As the owner of a Therma-HEXX ThermaPANEL (PANELS) heat exchange system, you play an important role in ensuring proper operation over the lifetime of the system and ensuring that Therma-HEXX's limited warranty remains in effect. We recommend that you adhere to the following guidelines:

- Consult with a licensed professional contractor to develop the appropriate inspection and maintenance schedule for your system.
- Perform visual inspection, at least annually, of all accessible system components to ensure products and fluids are functioning as intended.
- Do not modify or alter the PANEL or piping system. Only a licensed professional contractor who is familiar with its operation should service or alter the system.
- Follow all manufacturer recommendations for service and operation.
- Do not expose Therma-HEXX products to harmful chemicals, oil or petroleum products, paint, adhesives, solvents, household cleaners or aggressive water.
- Ensure that Therma-HEXX piping, fittings and PANEL units are concealed or insulated to protect them from exposure to long term UV radiation from sunlight or artificial sources.
- Do not expose the PANEL and piping system to freezing or overheating conditions unless the system was specifically designed to perform within certain seasonal temperature ranges. If the system will remain inoperative for a period of time, or be exposed to conditions that are outside of the design limits, arrange for the proper winterization or summerization of the system by a licensed professional contractor.
- An adequately sized expansion tank and pressure relief valve that is sized to meet the specification of the PANELS and piping must be installed in the system to prevent over pressurization of the system due to overheated fluids. It is recommended that an automatic glycol feeder be installed in closed loop systems that are subject to freezing conditions to keep the system pressurized to the recommended system pressure and to compensate for pressure loss due to minor leaks and evaporation in the system.
- For heating and geothermal applications, if freezing conditions are likely to occur, then a freeze protection fluid must be used.
- Do not allow the system to be exposed to temperatures and / or pressures outside of the limits as specified for the PANEL units or piping.
- Use caution when drilling or nailing into the area where the ThermaPANEL units or tubing are installed. Identify the location of the PANELS and pipe to ensure that nails or screws do not puncture the Panels or pipe.
- Use caution when digging in the vicinity of the PANELS, pipe or manifolds as you would with any buried utility system.

Any updates to this publication will be available at www.therma-hexx.com.

Sincerely,

Therma-HEXX Corporation

Therma-HEXX LIMITED WARRANTY

Subject specifically to the terms of this Limited Warranty, including the General Warranty Terms set forth below, Therma-HEXX Corporation, ("Therma-HEXX") provides solely and specifically to the owner of the applicable real property at the time of the installation and the first transferee thereafter of such real property the following Application-Specific Warranties.

Terms in *italics* shall have the meanings set forth below in the Definitions section.

Application-Specific Warranties

Radiant Heating/Cooling, Snow and Ice Melting
(i) PANELS, pipe and fusion fittings sold as ThermaPANEL™, ThermaPE-RT™ and ThermaFUSE™ shall be free of defects in material and workmanship for a period of twenty-five (25) years. (ii) Fittings, pipes, equipment, tools and components supplied by or specified for inclusion in a Therma-HEXX system are not covered by this warranty and are subject to the individual manufacturers warranties of said products.

General Warranty Terms

All of the above Application-Specific Warranties are subject to the following General Warranty Terms:

All warranty periods begin on the date Therma-HEXX sells the products in question and only apply to *Products* manufactured by Therma-HEXX.

In order for this Limited Warranty to apply: (i) the handling, use, installation and maintenance of Products must continually comply with Therma-HEXX technical requirements as set forth in *Therma-HEXX Technical Guidelines*; (ii) design, installation, inspection and testing of the system, including testing under pressure of *Products* after installation, must have been carried out in accordance with applicable building, mechanical and electrical codes and Therma-HEXX approved guidelines; (iii) installation of *Products* must have been carried out by a Therma-HEXX certified, registered and licensed installer; (iv) *Products* must not be damaged during or after installation from freezing, improper burial, fastening, mishandling, or any other circumstances beyond the control of Therma-HEXX; (v) *Products* must not be damaged by tear, break, puncture, crushing or other stress due to concrete stress cracks or any other external forces; (vi) *Products* must not be subjected to damage, abrasion or wear caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair; (vii) *Products* must not be exposed to ultraviolet light beyond the published UV exposure limits; (viii) *Products* must not be exposed to *Elevated* temperature *Applications* and/or *Pressure* conditions beyond their rated value; (ix) *Products* must not be exposed to harmful chemicals, aggressive water conditions or any external influences that cause damage to the *Products*; (x) *Products* must be stored in a clean, dry environment; and (xi) *Products* must be installed for their intended use and in the applications defined by the applicable *Therma-HEXX Technical Guidelines*.

THE LIMITED WARRANTY HEREIN PROVIDED IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED ON THE PART OF THERMA-HEXX. THERMA-HEXX DISCLAIMS ANY WARRANTY, EXPRESSED OR IMPLIED, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

In order to make a claim under this Limited Warranty, Therma-HEXX must be informed immediately and no later than thirty (30) days after the occurrence of an event giving rise to a breach of the Limited Warranty and while the damaged portion of the project is still open for inspection to enable Therma-HEXX to determine whether Therma-HEXX has any liability for the defective Product. If this notice is not given, and inspection is not possible, then this Limited Warranty is void. Additionally, in order for this Limited Warranty to be valid a claimant must return the allegedly defective product to Therma-HEXX for examination.

If a Product is defective, Therma-HEXX's liability shall be limited, at Therma-HEXX's option, to replacing or repairing the defective Product in question or providing a refund of the defective Product's purchase price. Therma-HEXX will not be liable for any costs of labor, removal, reinstallation, transportation, or any other charges which may arise in connection with a warranty claim. THE SOLE AND EXCLUSIVE REMEDY PURSUANT TO ANY CLAIM OF ANY KIND, INCLUDING BUT NOT LIMITED TO A CLAIM IN AFFILIATES, SHALL BE LIMITED TO THE LIMITED LIABILITY OF THERMA-HEXX DESCRIBED IN THIS PARAGRAPH. THERMA-HEXX SHALL NOT BE HELD RESPONSIBLE FOR DAMAGE TO PERSON OR PROPERTY, INCIDENTAL OR CONSEQUENTIAL LOSS, LOSS OF PROFIT AND LOSSES ON GOODS IN STORE OR THE LIKE, IRRESPECTIVE OF THE CAUSE. Some States and Provinces do not allow the exclusion or limitation of incidental or consequential damages and some States and Provinces do not allow limitations on how long implied warranties may last. Therefore, the limitations or exclusions above may not apply to you. This Limited Warranty gives you specific legal rights and you may also have other legal rights which vary by State or Province. Any action for breach of warranty must be commenced within one (1) year of the date of the breach of warranty, unless such limitation is barred by law. This limited warranty applies to the United States and Canada, other than the Province of Québec.

General Warranty Terms

For purposes of this Limited Warranty, the following definitions shall apply:

Elevated Temperature Applications: Applications where the continuous temperature operating conditions are greater than 120°F (48.88°C)

Pressure: Air or hydraulic pressure

Hardware: Distribution manifolds, thermostats and valve actuators

Insulation Cover: Thermal insulation and/or outer casing

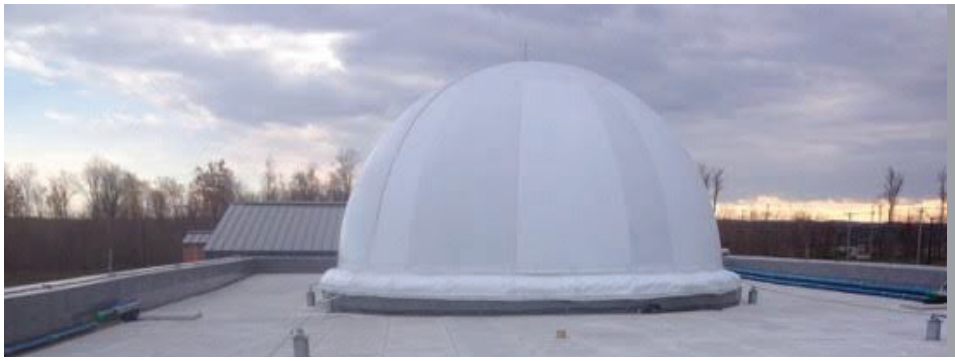
Pipe: Therma-HEXX brand ThermaPE-RT PE-RT HDPE pipe

Product(s): Therma-HEXX brand products including ThermaPANEL heat exchange panels, ThermaPE-RT pipe and ThermaFUSE fittings referenced individually or collectively

Therma-HEXX Technical Guidelines: The most current and applicable versions of all the technical literature is available on the Therma-HEXX website at www.therma-hexx.com, including but not limited to technical manuals, installation guides, technical bulletins, training presentations and submittals.

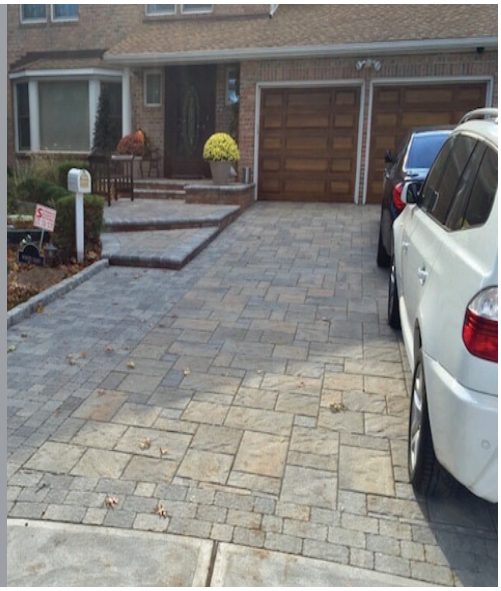
Diverse Applications


Snowbird Ski Resort - Hidden Peaks Lodge - High Performance Snowmelt




North American Missile Defense System - High Performance Snowmelt





Long Island, NY - Snowmelt and Solar Pool Heating

Solar Collection, Snow Melting, Cooling

Google Offices Pittsburgh, PA - Sky Bridge - Snowmelt

Brooklyn, NY - Rooftop Terrace - Snowmelt and Cooling

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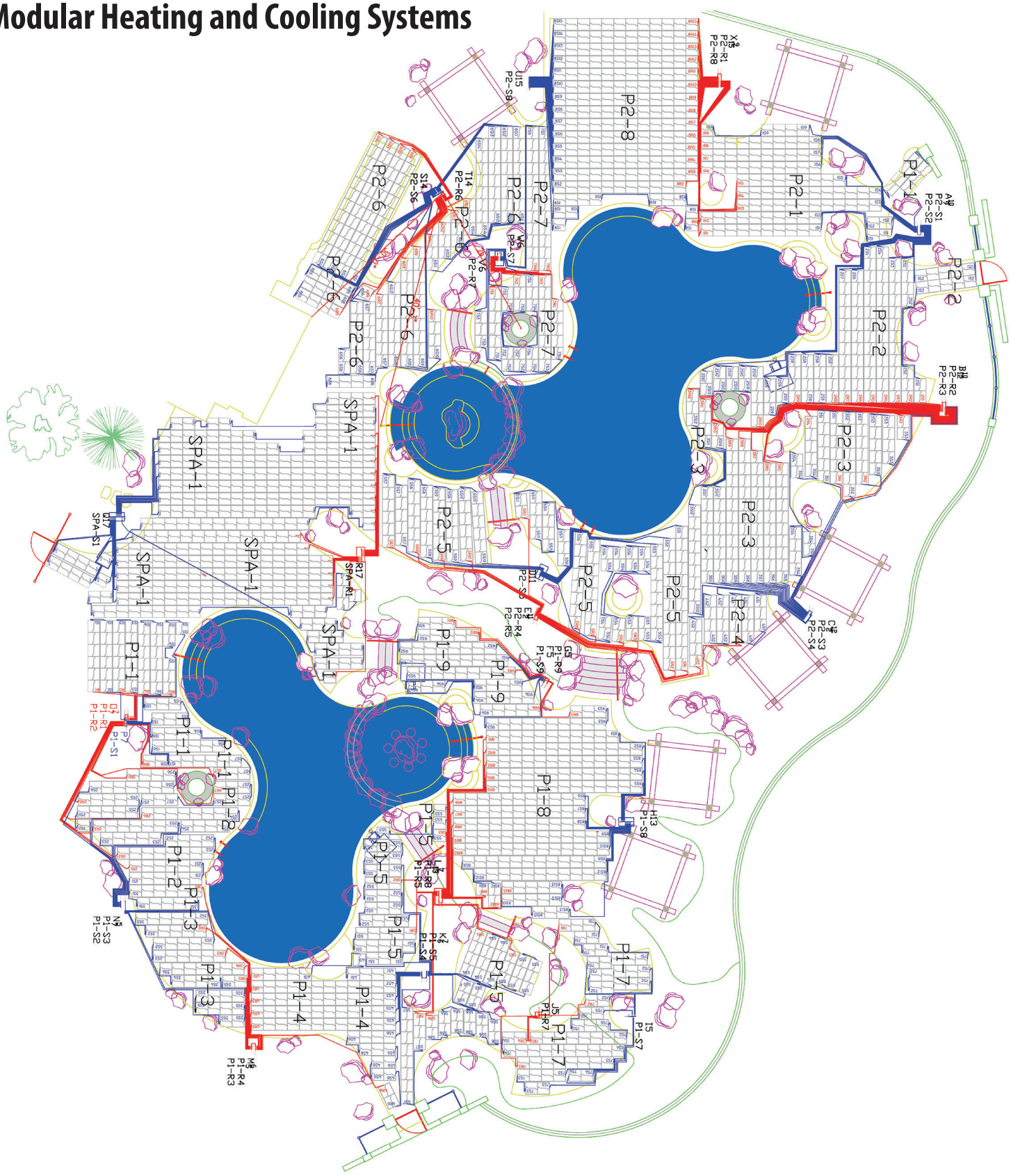

Project layout - Solar pool heating / patio cooling application