

Zehnder Rittling Corporate Headquarters and Manufacturing Facility



Heating

Cooling

Fresh Air

Clean Air

Zehnder Rittling uses its own products to operate a highly energy-efficient manufacturing facility. From radiant ceiling panels, to geothermal heat pumps, to heat recovery technology, a minimal amount of energy is used to heat and cool the building. Waste energy is captured from the paint ovens and used to heat the ZIP Radiant Panels, keeping the 150,000 sq. ft. production area at a comfortable 70 °F, even through the infamous Buffalo winters. www.zehnder-rittling.com

zehnder
Rittling

Property:

Zehnder Rittling
Corporate Headquarters and
Manufacturing Facility

Location:

Buffalo, NY

Owner:

Zehnder Rittling

Architect:

CK & Associates

General contractor:

The Krog Corp.

Design/build contractor:

Allied Mechanical

Project cost:

\$8.5 million

Footprint:

160,000 sq. ft.

■ Historical data

Zehnder Rittling is built upon a remediated brownfield on the former Republic Steel site. At its peak in the 1960's, Republic Steel was the third largest steel producer in the United States. The company ceased operations in 1984, and the 250-acre site was considered hopelessly contaminated from decades of steel manufacturing and coke processing operations. Fortunately, the abandoned land was acquired by Steelfields, Ltd. in 2002. The \$20 million remediation, one of the most expensive and largest privately-funded cleanup projects ever done under the NYS Voluntary Cleanup Program, began in 2003 and was completed in 2007. Zehnder Rittling owns a 31-acre parcel on the 185-acre site.

■ Customized solution**Radiant Ceiling Panels**

Powder-coated aluminum ZIP Ceiling Panels create a pleasant, draft-free climate where the perceived temperature is higher than the air temperature. This effect can achieve energy savings of over 40% compared with other systems.

Heat recovery coil

A stainless steel hot water coil captures nearly one third of the waste heat from the powder coat paint line's bake oven. With a natural gas capacity of six million BTU/hr, it recovers enough energy to heat the radiant panels installed throughout the facility, keeping the boiler system inactive except for routine maintenance.

Energy recovery ventilator|

During the winter months, heat is transferred from the warm inside air being exhausted to the fresh, but cold, supply air. During the summer months, the cool inside air chills the warmer supply air, thus reducing both winter heating costs and summer ventilation/cooling costs.

Geothermal heat pump

More than four miles of tubing is buried ten feet below the surface to use the moderate ground temperatures as a source for hydronic heating and cooling. As water runs through the tubing, it absorbs heat from the ground in winter and releases heat to the ground in summer, increasing system efficiency and reducing operational costs.

Automatic blinds

As the facilitator for the solar gain management strategy, the automatic blinds are the main component of a system that electronically senses changes in sunlight conditions and continuously adjusts to let in the optimum amount of light while regulating heat. Significant energy savings are achieved through reduction in heating and/or air conditioning costs.

■ Energy savings

Compared to the building the company previously occupied in Hamburg, NY, the result of the new construction and the technology utilized within the space has generated an estimated monthly energy savings of \$15,000.

Psychrometric Test Laboratory

The Zehnder Rittling Psychrometric facility is an 8-ton, single-chamber laboratory that tests the safety, reliability and various aspects of performance of Zehnder Rittling products in a controlled environment, meeting specifications under which the equipment will operate. The test chamber allows Zehnder Rittling to determine equipment range of operation, determine performance of custom products and expedite product development, bringing new features and equipment to market faster.

Specification		Description
Test chamber	Useable space	Room: 11' W x 11' L x 12' H Door: 5' W x 8' H
	Airflow	10,000 SCFM
	Temperature range	32 °F to 120 °F DB ±0.5 °F
	Humidity range	37 °F to 75 °F WB ±0.5 °F (95% RH maximum)
	Capacity	8 ton
	Cooling system	25 HP water-cooled DX refrigeration
	Heating system	Sheathed Incoloy elements
	Temperature control	UUT inlet via ASHRAE sampling tube
	Electrical	0 to 460VAC, 1 and 3ø, 60 Hz
Airflow module	Design	ASHRAE Standard 37-1988
	Flow range	65 to 3,000 SCFM ±1.0%
	Nozzles	2", 3", 5.5", 6"
Fluid module	Flow range	2 to 20 gpm ±1.0%
	Temperature range	40 °F to 220 °F
	Heating capacity	30 kW
	Cooling capacity	96,000 Btu/hr
	Reservoir	40 gallons



Radiant heat & cooling

The radiant system operates at lower heating (125 °F) and higher cooling (60 °F) fluid temperatures than a comparable air system. In cooling mode, the building automation system monitors the dew point along with the humidity levels and responds in all zones accordingly. When the humidity level rises, the system will either turn the panels off or raise the temperature via the heat pump.

Geothermal heat pump

More than four miles of tubing is buried ten feet below the surface to use moderate ground temperatures as a source for hydronic heating and cooling. As water runs through the tubing, it absorbs heat from the ground in winter and releases heat to the ground in summer, increasing system efficiency and reducing operational costs.



Automatic blinds

The automatic blinds are the facilitator for Zehnder Rittling's solar gain management strategy. The blinds are operational above 33 °F and with wind speeds below 15 mph to prevent damage due to ice build up and high winds. The light enable set point to lower the blinds is 85% or higher for optimum solar control, blocking summer heat and retaining winter warmth.

ZIP Radiant Ceiling Panels

Powder-coated steel ZIP Ceiling Panels create a pleasant, draft-free climate where the perceived temperature is higher than the air temperature. This effect can achieve energy savings of over 40% compared with air systems.

- Run at 130 °F AWT
- 150,000 sq. ft. facility
- Average winter temperature: 19 °F to 43 °F



Heat recovery coil

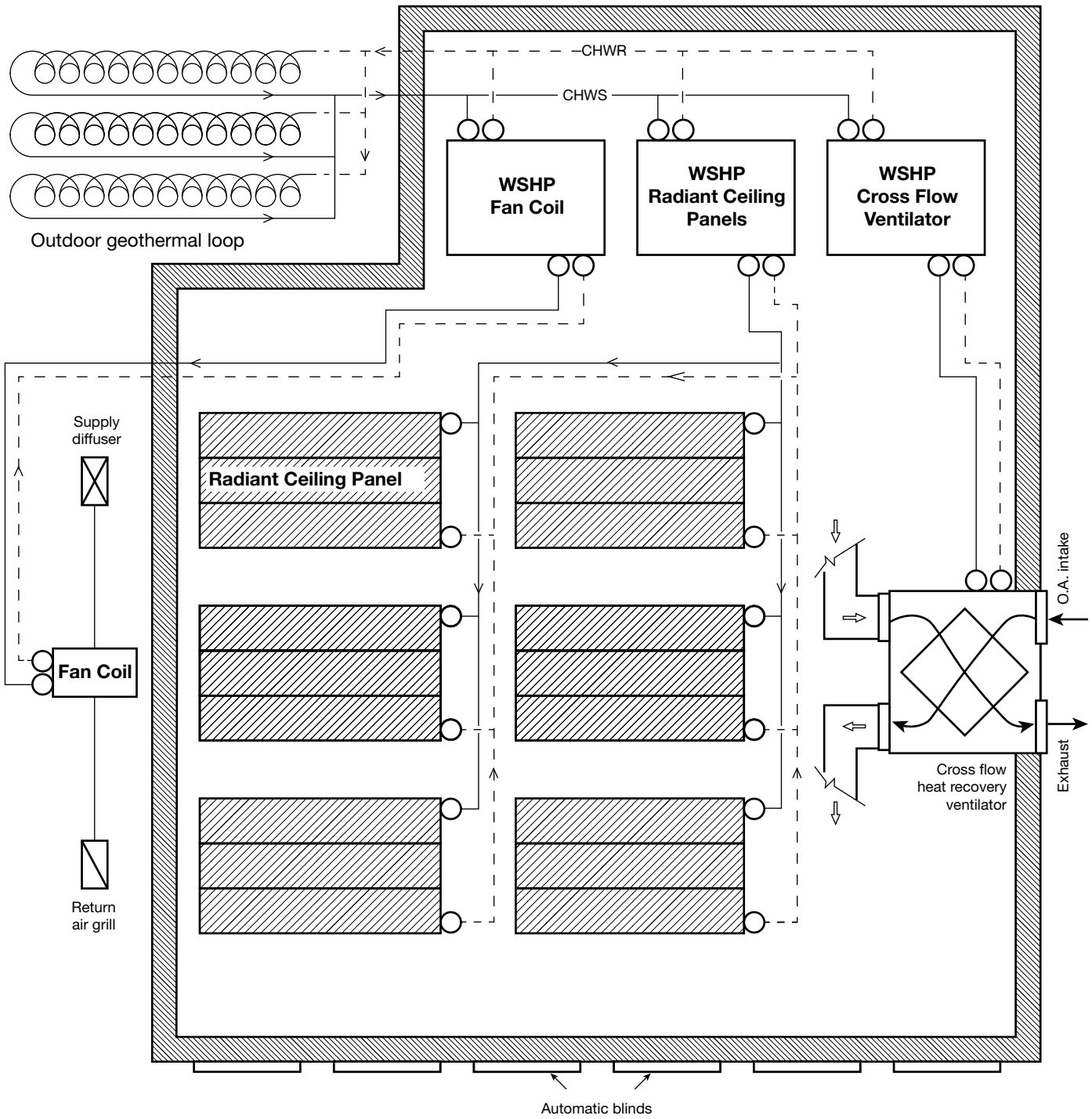
Zehnder Rittling utilizes an air-to-water heat exchanger to collect waste process heat from the paint line bake oven. Warm air from the 400 °F oven is discharged through a stainless steel coil which heats the water to 135 °F. The warmed water heats the ZIP Radiant Ceiling Panels to provide heat to the shop floor. The facility's boiler system is inactive except on winter weekends when the plant is closed and when needed for routine maintenance.

Heat recovery ventilator

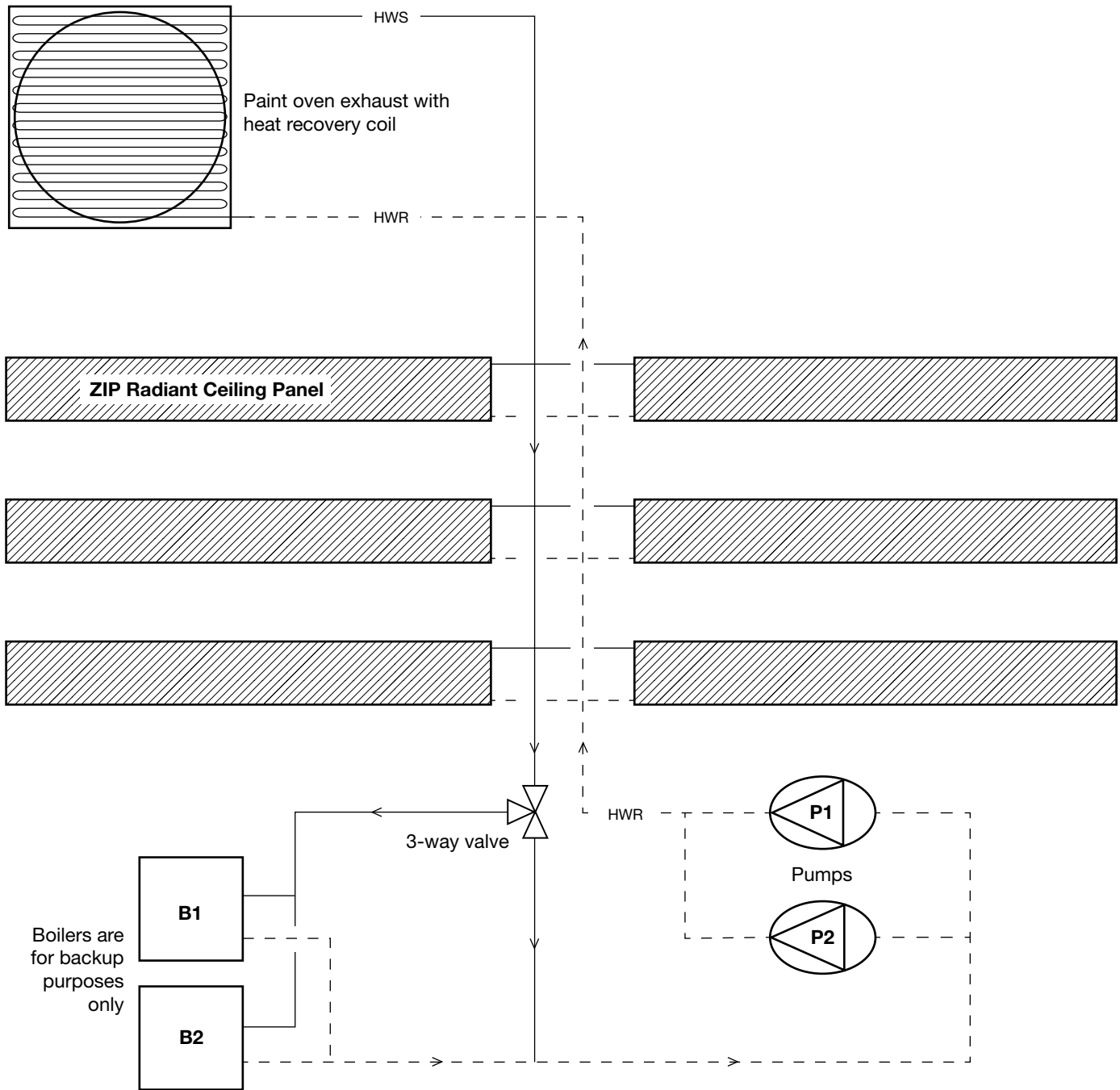
The heat recovery ventilator uses a cross-flow heat exchange membrane that is 90% efficient. During the winter months, heat is transferred from the warm inside air to the fresh, but cold, supply air. During the summer months, the cool inside air chills the warmer supply air reducing both winter heating costs and summer ventilation/cooling costs.



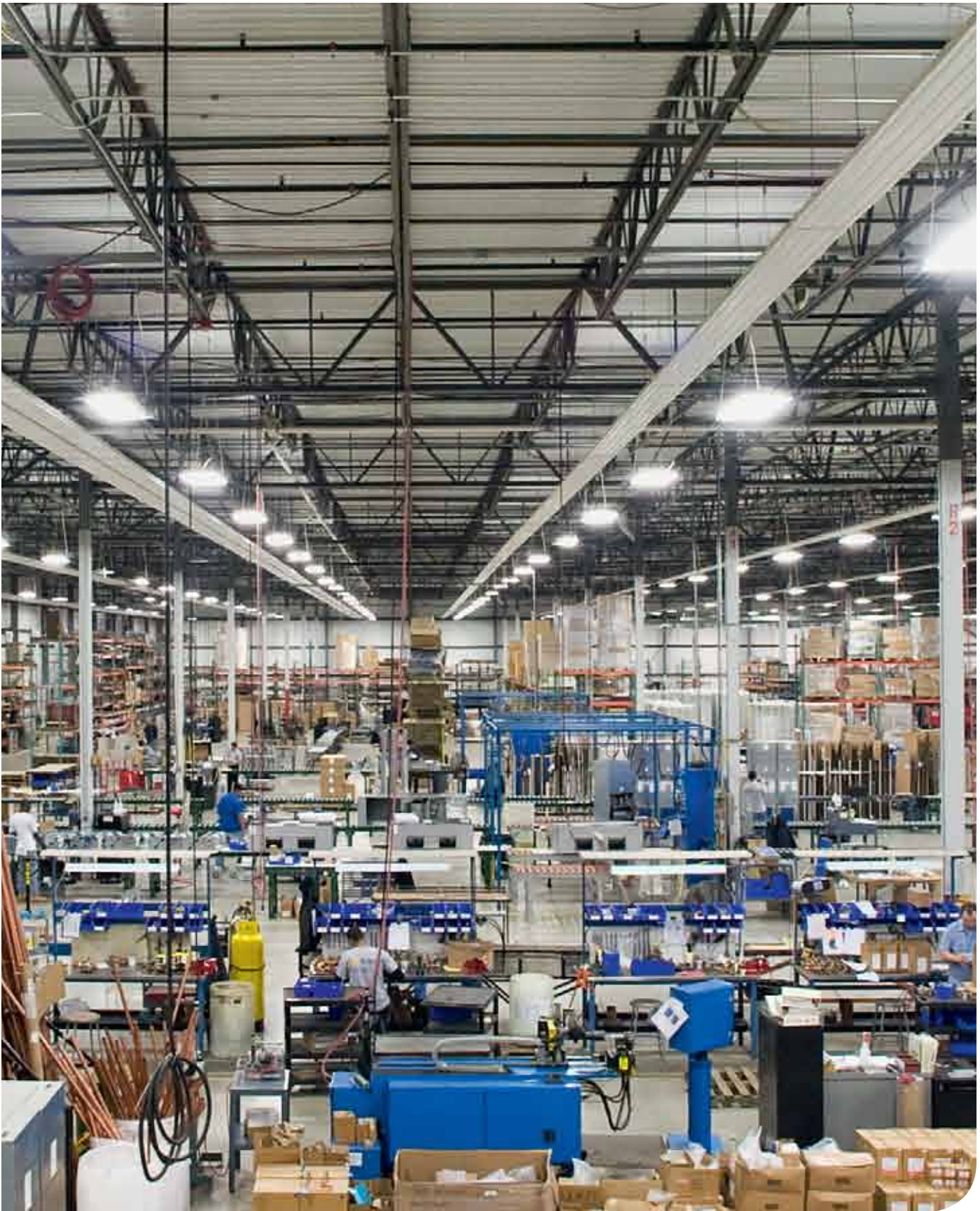
Schematic: Office area



Schematic: Shop floor, heat recovery loop



Boilers run 3 hours per day on weekends between November and March, but only when the plant is closed and the waste process heat from the paint line bake oven is not available. The boilers also run about 6 hours per year for routine maintenance.



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