ELARA ENGINEERING

Big Picture Thinking. Practical Approach. Sustainable Design.

Loyola Center for Translational Research and Education (CTRE) Winter Cooling Heat Exchanger

FIRST PLACE
ASHRAE Excellence in Engineering Award
Chapter Level

Project Highlights and Results

- Existing campus chilled water system with a network of three chiller plants distributed through Loyola University Health Science Campus (LHSC) buildings, including the CTRE
- Evaluated options to resolve performance issues with a waterside economizer impacting chilled water supply temperatures resulting in overheated spaces in the CTRE.
- Designed and implemented new winter cooling heat exchangers that reduced cooling fan energy, pump energy, chiller energy, and energy used for heat tracing, while increasing the amount of energy recovered for air systems.
- Ongoing operation is now simpler as the new system is limited to two new heat exchangers, piping, two control valves, and a new split system located entirely indoors which all require minimal maintenance.

Project Background

Owner:	**Loyola University Chicago**
Location:	**Maywood, IL (Loyola University Health Science Campus)**
Team/Team Lead:	**Brian Malone**
Elara Role:	**MEPFP**
Construction Cost:	**$400,000**

Project Overview

Building Type:	**Research Laboratory**
Building Attributes:	**7-Stories, including lower-level Vivarium and Mechanical Penthouse; 230,000 SF**
Intitial Construction:	**2016**
MEPFPIT Systems:	**Campus Chilled Water (Chiller plants), Laboratory DOAS Air Handlers, Chilled Beam, Fan Coil Units, Heat Recovery, Natural ventilation, DDC**

Innovation

- Implemented solution consists of a new water-to-water heat exchanger that connects the CTRE chilled water loops to existing heat recovery coils in the air handlers. Additionally, no new pumps were required as all existing pumps were found to be capable of supporting the new heat exchangers.
- A key benefit of the new design is that the system can now be changed over quickly from the new heat exchanger to the original chiller loop with four manual changeover valves and one existing automatic control valve.
- The new heat exchangers, in combination with the existing heat recovery chiller, can carry the CTRE chilled water demand up to 50°F+ outdoor air temperatures allowing the system to remain in operation without intermittent changeover during unseasonably high temperatures.
- The design incorporated trend data to evaluate the capacity of the existing systems and determine new equipment capacities.
- Laboratory buildings such as CTRE generally consume large amounts of energy when compared to other building types and uses. Elara's solution helped improve energy performance while reducing maintenance, resource, andequipment costs relative to more commonly used strategies for winter cooling.