ELARA ENGINEERING

Big Picture Thinking. Practical Approach. Sustainable Design.

KCC Riverfront Campus Infrastructure Improvements

Project Highlights and Results

- At KCC, Elara's approach started small at the end-use (room) level and worked back to the plant in phases to achieve the following results over seven years:
  - Over 23% energy use reduction and $840,000 utility cost savings
  - $190,000 obtained in incentive funding
  - Additional savings from avoided maintenance and future equipment replacements
- Elara's Master Infrastructure Plan for the entire campus included full review of existing HVAC equipment, and associated controls infrastructure to document existing condition, remaining useful life, critical needs, and energy savings opportunities with prioritization.
- A Seven-Phased Design and Implementation Plan prioritized Room Level, Distribution Level, and Plant Level needs as well as opportunities to fit within the College's annual budget constraints

Project Background

Owner:	**Kankakee Community College (KCC)**
Location:	**Kankakee, IL**
Team/Team Lead:	**Steve Maze, Matt Swanson, Bob St. Mary, Bhupendra Tailor, Cem Diniz**
Elara Role:	**MEP + Controls Engineer**
Type:	**Campus Retrofit/Energy Upgrades**
Construction Cost:	**$6,600,000**

Project Overview

Building Type:	**Higher Education, Campus**
Building Attributes:	**8 Buildings; 360,000 Total SF**
Initial Construction:	**1970s with 1988, 19992, 2004, 2006 additions**
MEPFPIT Systems:	**CHW Plant w/ Ice Storage, Steam Boiler Plant, (25) AHUs**

Innovation

- Master Infrastructure Plan identified the following needs/opportunities, estimated the investment and savings for each, and recommended prioritization for a phased implementation:
  - Replace aged equipment (Need)
  - Consolidate and eliminate equipment (Opportunity)
  - Convert from steam to hot water space heating (Opportunity)
  - Improve energy performance and reduce utility costs (Opportunity)
- Multi-year (one phase per year) design and implementation schedule addressed the

following mechanical infrastructure improvements:

- Room Level
  - New Direct Digital Controls (DDC) with optimized sequences of operations.
- Distribution Level
  - Replaced and redesigned 15 Air Handling Units (AHUs)
    - Converted from constant to variable volume and from steam to hot water heating, eliminated 4 AHUs (over 25% reduction)
  - Added cooling to areas previously without space cooling
  - New Direct Digital Controls (DDC) with optimized sequences of operations.
- Plant Level
  - Consolidated systems (eliminates 2 chiller plants and 6 supplemental cooling systems)
  - Converted from steam to hot water heating
  - Reduced plant investment (eliminates steam and installed smaller hot water boilers, converted to smaller higher efficiency chillers, and reduced load)
  - New Direct Digital Controls (DDC) with optimized sequences of operations.