Project Partnership Collaborated On A $65 Million Guaranteed Energy Savings Project

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ESPC PROJECT OBJECTIVES

SAVINGS & PERFORMANCE GUARANTEE

COMPREHENSIVE FACILITY AUDIT

TURN KEY DESIGN PROCESS

LONG TERM PARTNERSHIP & COMMITMENT
UNIVERSITY OF ILLINOIS AT CHICAGO DATA

LARGEST UNIVERSITY IN CHICAGO

16,000,000 SF UNDER ROOF

33,000 STUDENTS

TOP 50 UNIVERSITY FEDERAL RESEARCH NATIONWIDE

PRINCIPAL EDUCATOR OF ILLINOIS HEALTHCARE PROFESSIONALS

UIC Flames Horizon League NCAA Div I-AAA
- Liberal Arts, & Sciences
- Art and Architecture
- Engineering
- UIC Flames Athletics
- UIC Forum and Pavilion
- Student Housing/Dining
- Hospital/OCC
- Pharmacy College
- Dentistry College
- Applied Health Science
- Medicine College
- Nursing College
- Public Health
- Student Centers
NEW AT UIC
COMPUTER
ENGINEERING
BUILDING

ADVANCE CHEMICAL
TECHNOLOGY BUILDING
120,000 SF Laboratories
LEED Silver min
Gold Expected

ENGINEERING
INNOVATION BUILDING
Chicago area's only high-bay structural testing laboratory
Targeted for completion in 2021

CDRLC is planned to be a 168,000 square foot/six story building facing Taylor Street and immediately adjacent to the Engineering Research Facility.

The building will contain flexible-module classrooms in a range of sizes and types to support new learning paradigms, as well as research labs, interdisciplinary student design space, and faculty and staff offices.

It will also house UIC’s Department of Computer Science. With the ever-increasing demand for our engineering and computer science programs, the CDRLC building will play an essential role in allowing the College to continue to fulfill its mission of access to excellence and success.
UNIVERSITY SELECTION PROCESS & FINANCIAL CRITERIA

INVESTMENT GRADE AUDIT

M & V

IMPLEMENTATION PROCESS

DESIGN PROCESS

UNIVERSITY PROJECT PRIORITIES

OVERVIEW
PROJECT HIGHLIGHTS

- **PROJECT COST**: $65,062,892
- **TOTAL ANNUAL COST SAVINGS**: $3,547,019
- **SQUARE FOOTAGE**: 1,221,820
- **WATT HOUR SAVINGS**: 12,842,578
- **METRIC TONS OF CO2 REDUCTION**: 19,277
- **ANTICIPATED ANNUAL OPERATIONAL SAVINGS**: $1,694,949
- **ANNUAL ENERGY & WATER COST SAVINGS**: $1,852,070
- **ANTICIPATED ANNUAL OPERATIONAL SAVINGS**: $1,694,949
Project RFP Process
3 different companies
given the opportunity to
present their proposals

Pre-Qualification of ESCO’s
Ameresco 1 of 8 entities
selected to exhibit
qualifications

OWNER
SELECTION &
FINANCIAL
CRITERIA
INVESTMENT GRADE AUDIT

ECMS AND APPROACHES DISCUSSED/MOCKUP OF FH OPTIONS

HIGH PERFORMANCE FUME HOOD SOLUTION OVER VAV FUME HOOD

AREAS FOR DRASTIC ENERGY CONSUMPTION REDUCTION

deferred maintenance emphasis
PROJECT GOALS

- Reduce energy consumption
- Reduce maintenance costs
- Laboratories opportunity for energy savings
- Engineering buildings efficiency opportunity

ENGINEERING BUILDINGS EFFICIENCY OPPORTUNITY
PROJECT DESIGN & DEVELOPMENT PROCESS

- Identify UIC Needs
- Measure Development
- Develop Project Work Plan
- UIC Review & Approval
- Regulatory Review & Approval
- Execute Energy Services Agreement
- Obtain Financing
- Savings Calculations, Costing, Financial Modeling
- Utility & Field Data Acquisition
- Energy & Water Analysis
- Energy Modeling
SELECT ENERGY CONSERVATION MEASURES

5 CAMPUS BUILDINGS

Upgrade Interior Lighting System

Replace Fume Hood Exhaust Fans with roof mounted systems

Replace HTHW Absorber with new 500 ton electric chiller & retrofit cooling towers with VFDs

Replace constant flow labs & fume hoods with High Performance Low-flow Hoods

Install Konvekta system for heat recovery

Upgrade Existing HVAC system to Chilled Beam & VAV HVAC Systems

Retro-Commission AHUs and Upgrade Pneumatic Controls to DDC
1. Perform pre-balancing to identify ductwork leakage issues.

2. Engagement with health & safety department to review plans to modify airflow rates, fume hood operation and incorporate new technologies.

3. Perform thorough building inspection & identify potential issues such as fouling of air sensors due to dirty ducts.

4. Installer & owner should collaborate to agree on best M&V approach.

5. Installer & owner to agree on a commissioning methodology based on project scope.
IMPLEMENTATION & CONSTRUCTION

- Produce Detailed Designs
- Specify Equipment
- Purchase Equipment
- Execute Sub Contracts
- Review Submittals & Obtain customer approval
- Coordinate Construction with Customer
- Manage Construction Commission Measures
Secure All Applicable Rebates & Subsidies
Train Maintenance & Operations Staff

Reliance on hundreds of local contractors
Chicago Minority & Women owned businesses sub-contracted work exceeded $11,500,000

Secure All Equipment & Contractor Warranties & Obtain Acceptance

UIC chose to include a chilled beam HVAC solution
Separate Recovery Coil

TRADITIONAL RUN AROUND ENERGY RECOVERY

Exhaust Air From Space

From Supply Fan

Separate Recovery Coil

Pumps

Exhaust Air

Outside Air

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HIGH PERFORMANCE FUME HOOD
FUNCTIONAL PERFORMANCE TESTING
Performance test checklists customized for each component or system to be tested.
Incomplete work or deficiencies identified were documented and corrected

OWNERS ACCEPTANCE TESTING

1. TEST & BALANCE SUBCONTRACTOR
Began work after implementation of system/equipment start up
Created test & balance plan for the air & water distribution systems

2. FUNCTIONAL PERFORMANCE TESTING

3. OWNERS ACCEPTANCE TESTING
PERFORMANCE PERIOD & M AND V

1. Monitor, Measure & Verify Savings
2. Provide Maintenance Services
3. Conduct Equipment Inspections
4. Respond to changes in utility rates
5. New Technology
6. Train Staff
7. Submit Performance Reports
ACCURACY OF MODELED SAVINGS

1. Identify & field verify high-impact assumptions during the planning phase.
2. Conduct post-implementation testing to confirm that the high-impact parameters are within expected ranges.
3. Calibrate energy model within 5% of monthly energy usage.
4. Revise energy models after construction completion to reflect any field changes.
FOCUS CHANGE

MODEL & METER READINGS

COMMUNICATIONS DOCUMENT CHANGE REQUESTS

SEASONAL CHANGES

STANDARD LEAKAGE RATE

FULL-TIME PM & SUPPORT ADMINISTRATOR HIRE SUPPORT CONSULTANT?

ASSUMPTIONS

LAB STAFF & STUDENTS

SUMMARY LESSONS LEARNED
THANK YOU

QUESTIONS?