

1703 BROADWAY

Credit Human: setting new expectations of resilience, efficiency and community deep in the heart of Texas.

Kimberly Llewellyn, Mitsubishi Electric Trane US

PHIUSCon, November 2023

ORIGINS

The Hennigans were there to discuss a renovation of the home they had just bought in the same neighborhood they were living in with their 2 daughters. But the conversation started with a question, "What's possible?"



THE CLIENT

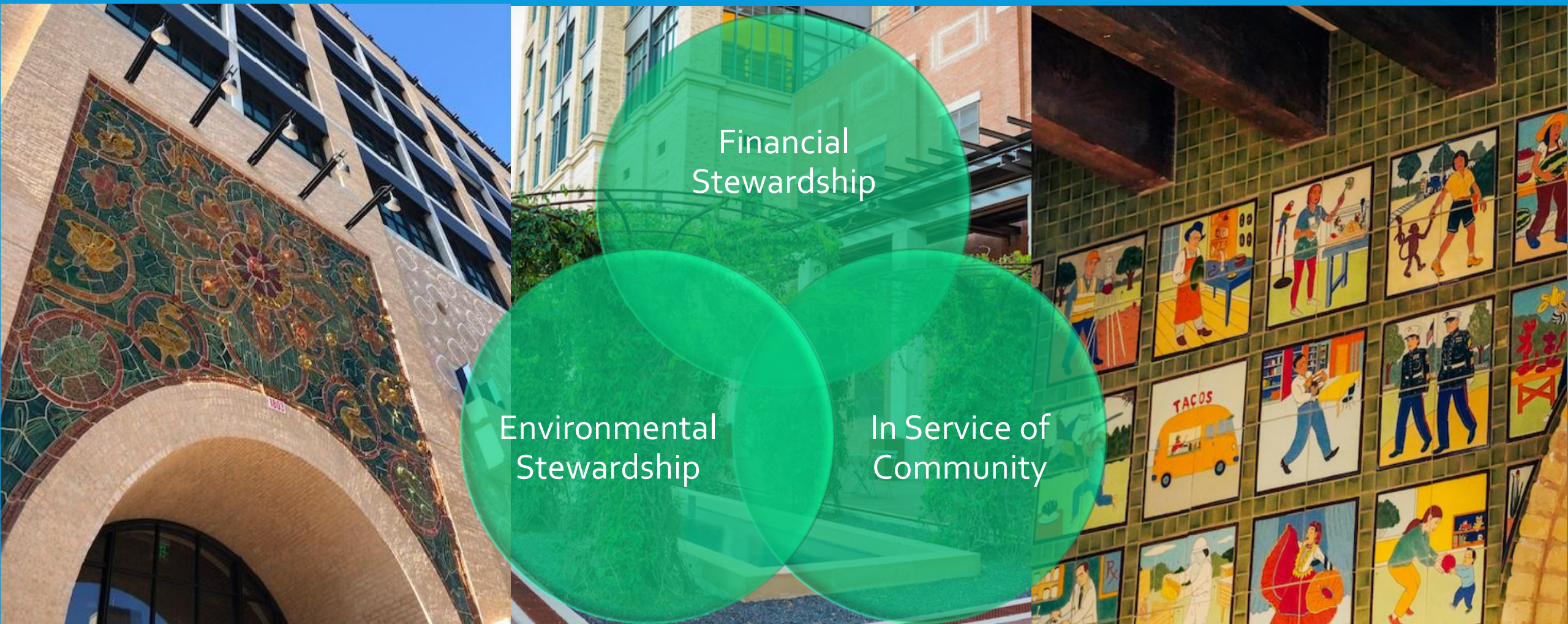
credit
human

Credit Human

- 100% member-owned, member-directed and member-governed credit union, chartered in 1935
- Serve more than 200,000 members across the U.S. with branches in San Antonio and Houston
- Operated our headquarters out of a six-story building northwest of downtown San Antonio for 40 years
- Believe that being good stewards of our **financial** resources and good stewards of our **environmental** resources go hand-in-hand



CLARITY OF PURPOSE RESULTS IN CLEAR GOALS



Financial
Stewardship

Environmental
Stewardship

In Service of
Community

THE 100 YEAR BUILDING



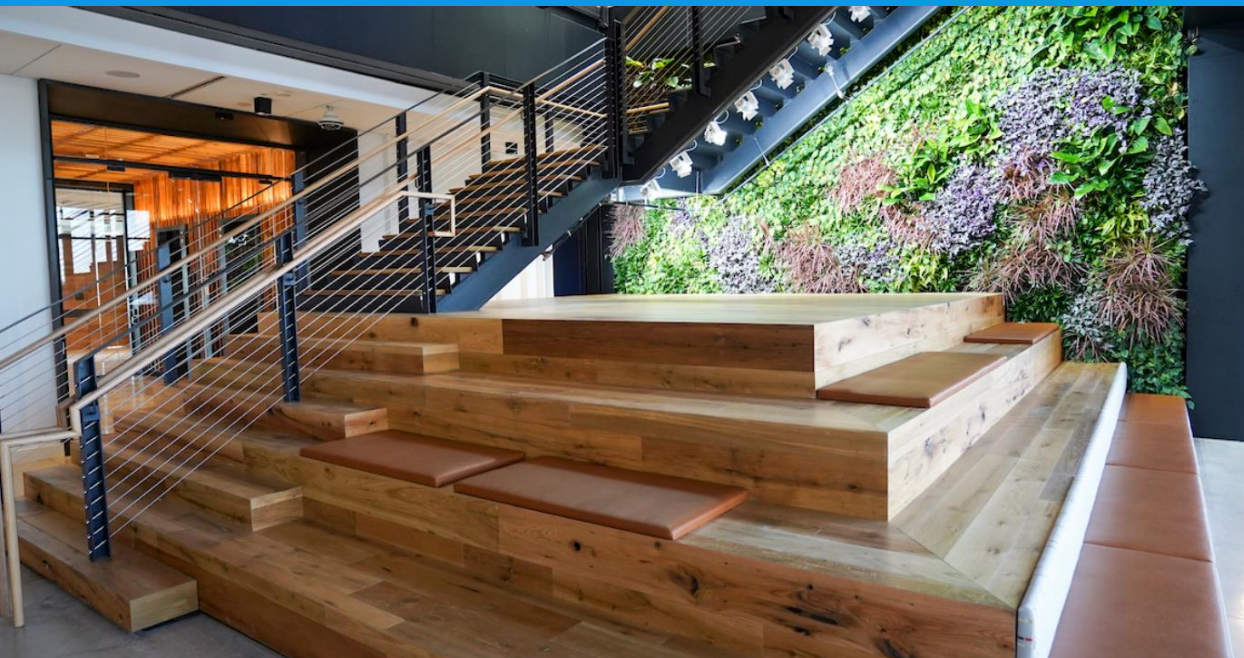
New Credit Human Headquarters in San Antonio, TX

- 12-Story, 215,000 ft², Office Building
- Fluid Applied Air Barrier
- Continuous Insulation
- Ground Source Heat Pumps
- Solar Array
- Water Catchment
- Automated Solar Shades

A HEALTHY, BEAUTIFUL PLACE OF WORK

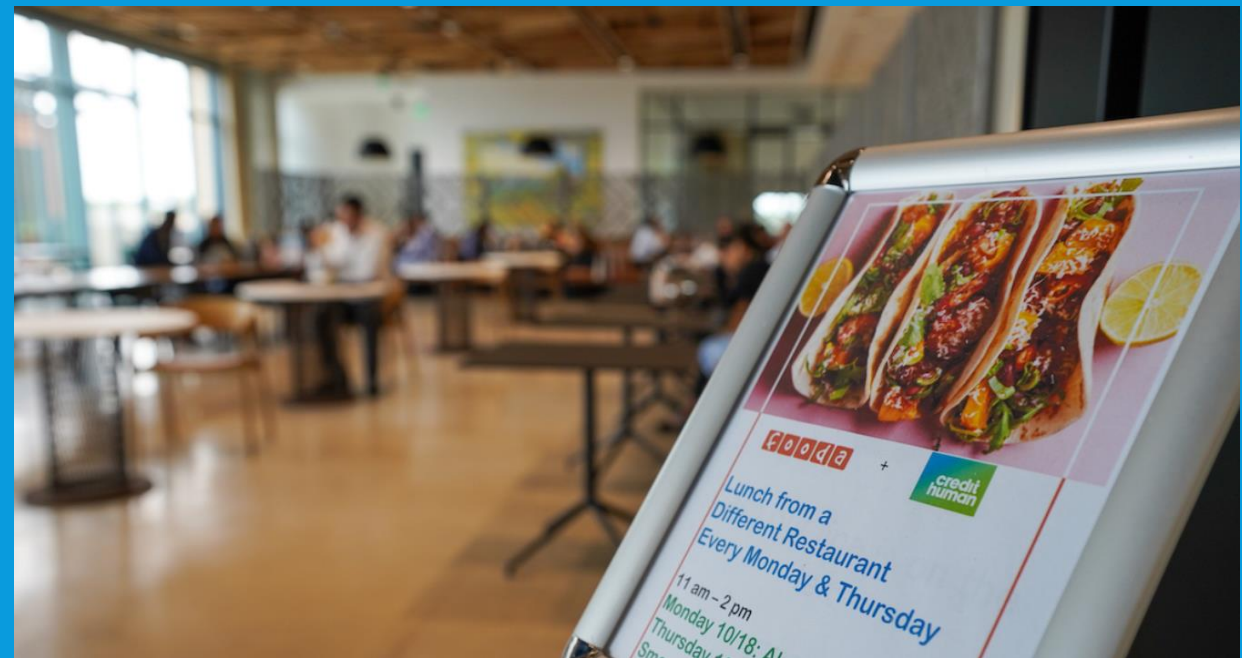
Values in Action

Green Wall and Community Stairs



Kitchen

No Single Use Plastic, Orca, Healthy Cafeteria



OWNERS WANT 100 YR BUILDING BUT OFFERED BAU

Cut and Paste AIA MasterSpec®

SECTION 238239 - HEAT TRANSFER

PART 1 - GENERAL

1.1 APPLICABLE REQUIREMENTS

- A. All work to be furnished and installed under this section shall comply with all the requirements of General Conditions, Supplemental Conditions, Division 01 - General Requirements, Section 230500 - Basic HVAC Materials and Methods, and other Sections in Division 23 specified herein.

1.2 SCOPE

- A. All work to be furnished and installed under this Section shall comply with all the requirements of Division 01, and shall include, but not necessarily be limited to, the following:
 1. Unit heaters.
 2. Cabinet heaters.
 3. Wall mounted electric cabinet heaters.
 4. Ceiling mounted electric cabinet heaters.
 5. Convectors.
 6. Electric Infra-red radiant heating
 7. Reheat coils (booster coils).
 8. Heat recovery coils.
 9. Shell and tube heat exchangers (convertors).
 10. Plate type heat exchanger.
 11. Small air-to-air heat recovery ventilators

Resistance to GSHP

Resistance to MW PV

Resistance to commit to air control

Resistance to High Efficiency ERV's

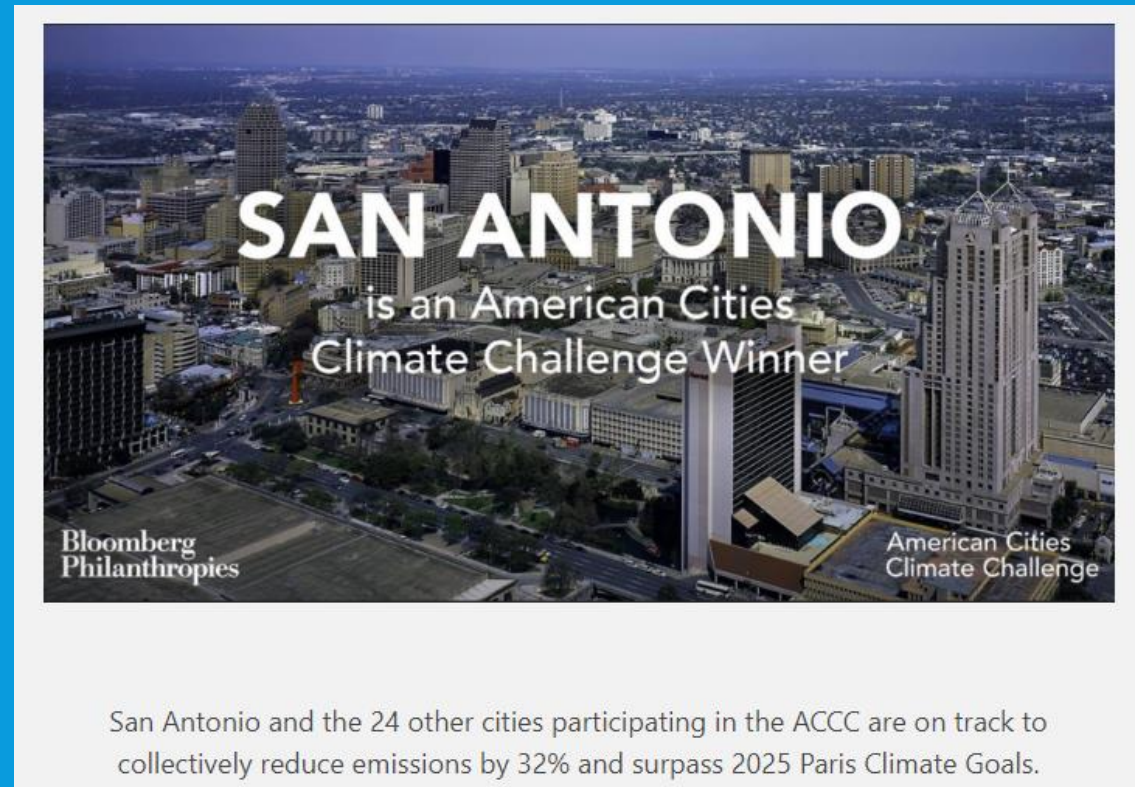
Energy Model with BAU Defaults

Loads 30-40% High

CODE & PROGRAM CONTEXT

IECC 2021 Commercial Energy Code

Site EUI for this sized Office BLG= ~35 kbtu/ft²/yr



https://www.energycodes.gov/sites/default/files/2022-09/2021_IECC_Commercial_Analysis_Final_2022_09_02.pdf

BUY IN FROM THE CITY- 2030 CARBON REDUCTION GOALS

Council approves Credit Human incentives

- Decade-long 100 percent tax abatement
- 5-year tax rebate with a total value capped at \$5.9 million

<https://www.mysanantonio.com/news/local/article/Council-approves-Credit-Human-incentives-12291870.php>

▪ Rationale for the Incentives

Retention of ~500 jobs in San Antonio

Mixed Use Space Development in Urban Core

CH Investment in Sidewalks, Streets and Parks

Creation of Community Spaces Onsite

CLEAR EXPECTATIONS OF PERFORMANCE

Excellent Coordination Lead by GC

JOERIS
General Contractors, Ltd.

Meeting Minutes

Project # 18018-0 - Broadway Office Development

MEPF Coordination Meeting #4

Date: October 08, 2019 Prepared By: Matt Dunn
Meeting Time: 1:00 PM - 4:00 PM Joeris General Contractors, Ltd.
Purpose: Mitsubishi Partnering Meeting Location: JGC Office Trailer

Item	Meeting Item Description	Due Date	Responsible	Cle'd
04-001	General Items The DOB files. Everyone has access to the cloud where DGI makes uploads & updates to the DOB file. I. Are we up to date & on the same page? DGI is uploading to Mitsubishi's cloud. II. How can we stay on the same page? Response: Keep using the cloud to update the DOB file. Henry to sit down with Daniel Moore & Chad Jebousek (DGI) to work thru and polish the DOB file (Thursday 10/10/19). Mitsubishi to address the units in the system once the file is completed to alleviate the automatic issue with addressing (Chris V to re-address equipment once the file is completed). The guys in the field to double-check the length of runs and update the DOB file if things change during install. Matt (Joeris) to verify field installation. III. Why is Giumac not saving and sending out the latest DOB file? Amanda (Giumac) to share Giumac's DOB file for Core & Shell & the T.I. Giumac Response: Because DGI should be keeping a DOB file for construction use (which DGI is has been doing). Mitsubishi to look into the level 1 issue (North Tower) that serves the electrical room with the units all being in heating not allowing the electrical room to be in cooling. Control panel quantity for level 1 VRF equipment. III. DGI to update the model with the Mitsubishi panels. Response: Per Mitsubishi: One panel in each tower. Mitsubishi to verify locations for these during Thursday's meeting at DGI's office (referenced above).			<input type="checkbox"/>

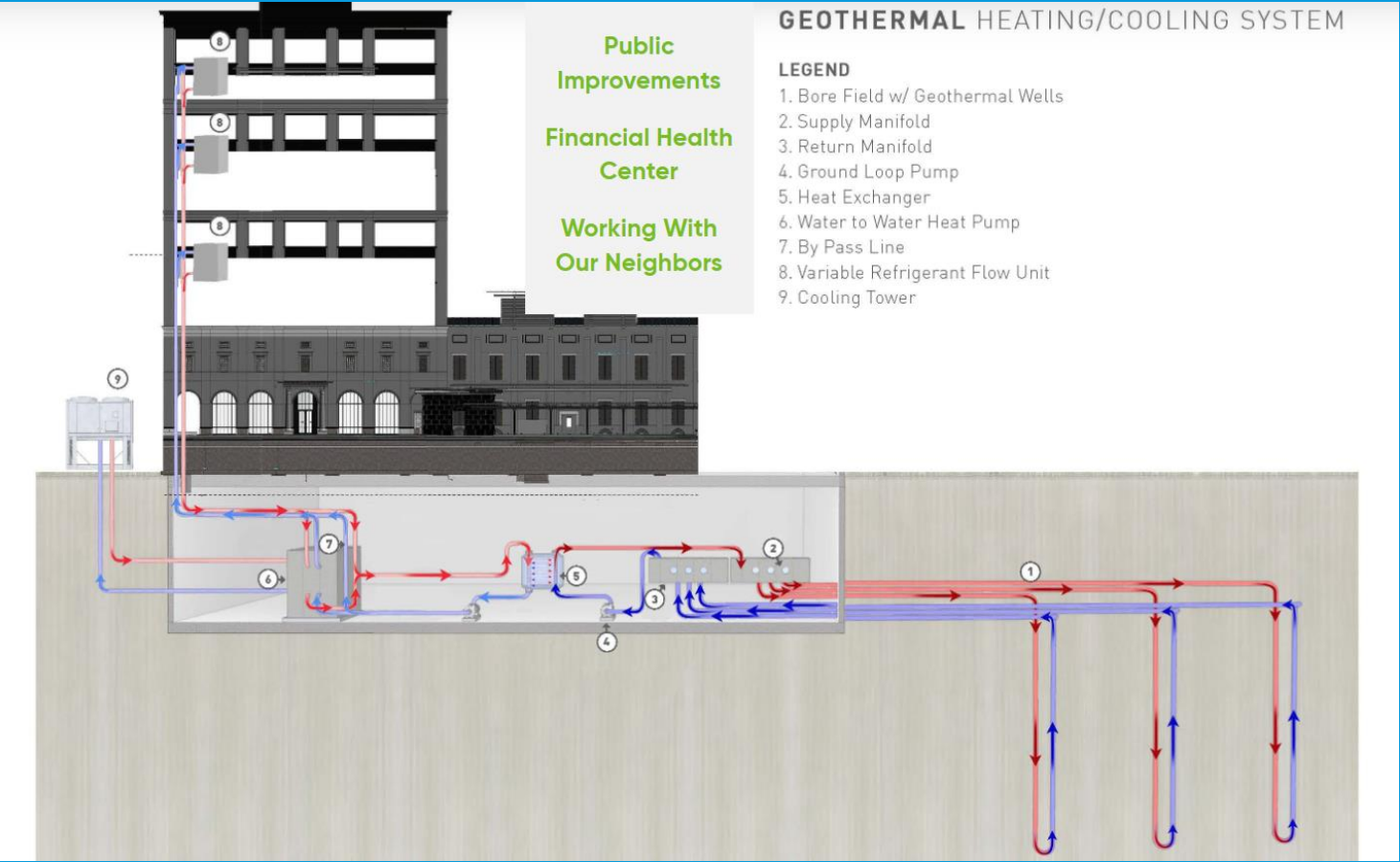
Where There's a Will...

The GC and site crews had never worked on a project like this before.

The owners set clear expectations for coordination and collaboration of all team members: GC, Subcontractors, Architects, Manufacturers and Owners.

One of the most impressive accomplishments was the successful installation of a high quality air barrier...

GROUND COUPLED VRF HEAT PUMP



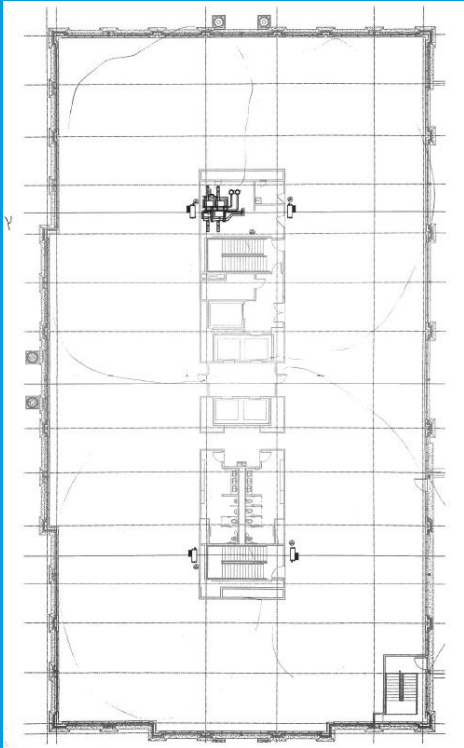
- 150 Wells
- 310' depth
- Ground Source High Efficiency VRF
- Meets 100% Heating Load
- Meets ~70% Cooling Load
- 2 Cooling Towers for Peak Load

WELLS AND PUMPS

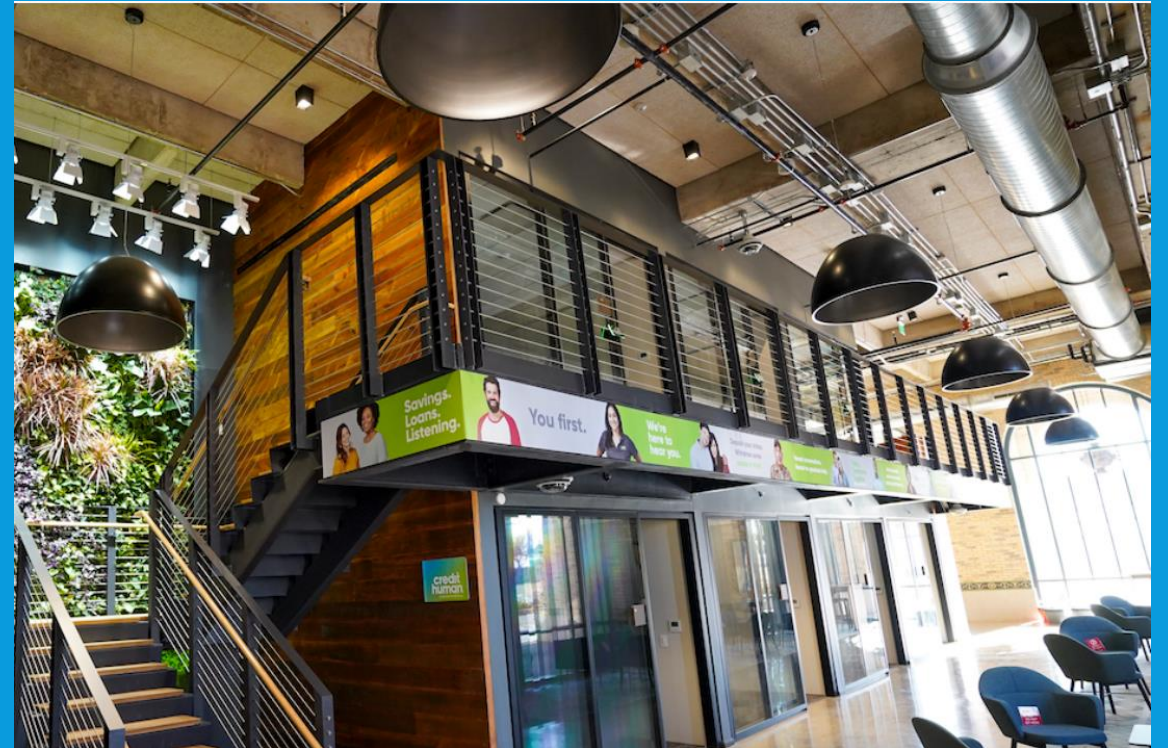


HVAC EXPOSED

Typical Mechanical Layout



Exposed Infrastructure



BEST IN CLASS VENTILATION

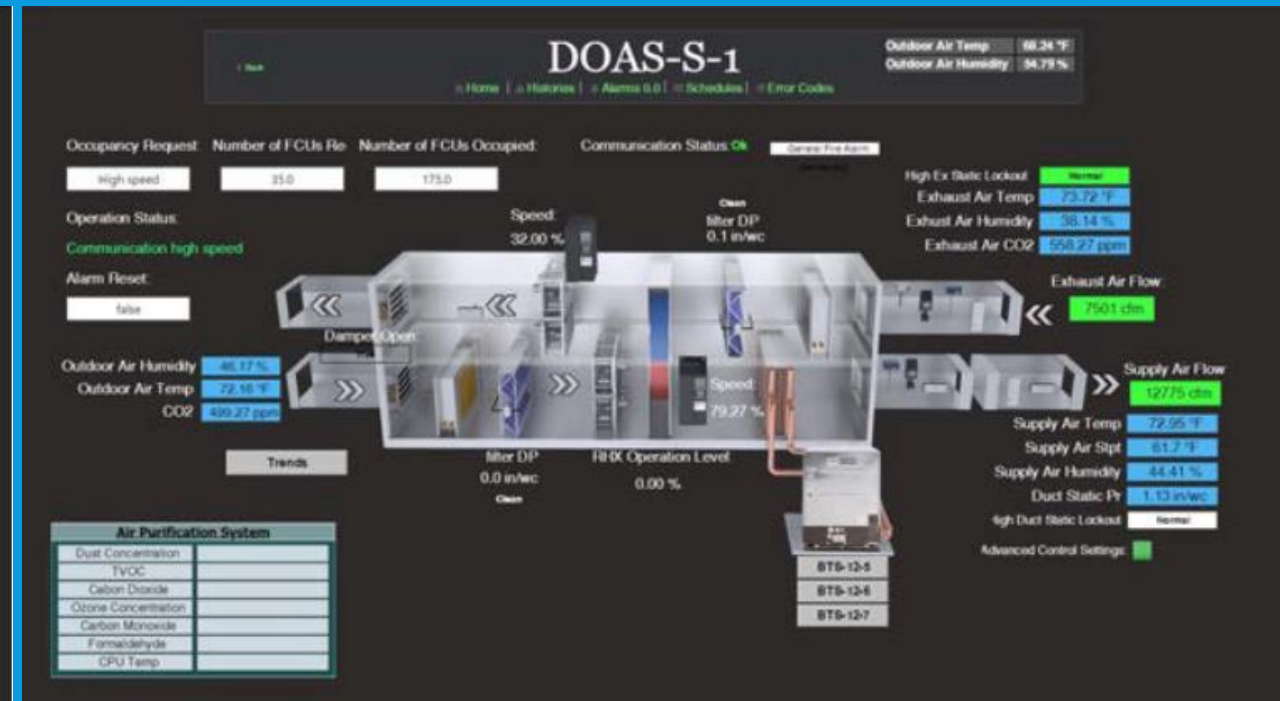
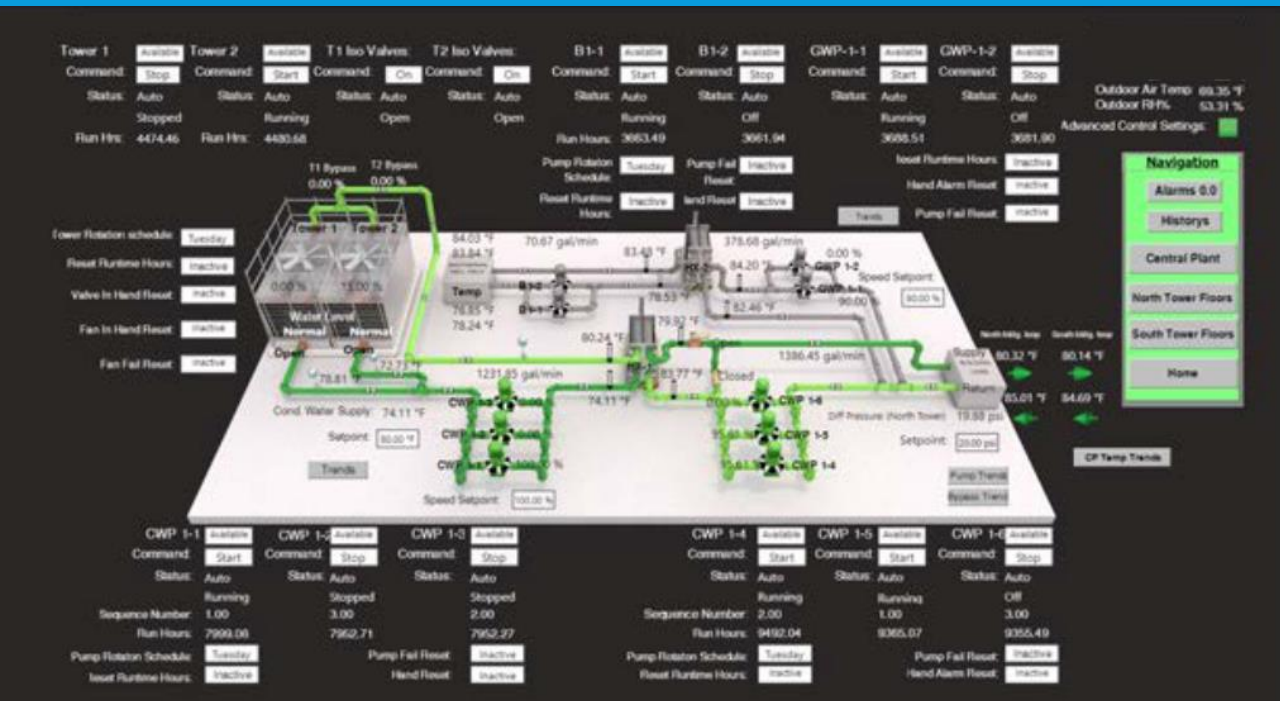
High Efficiency ERV's



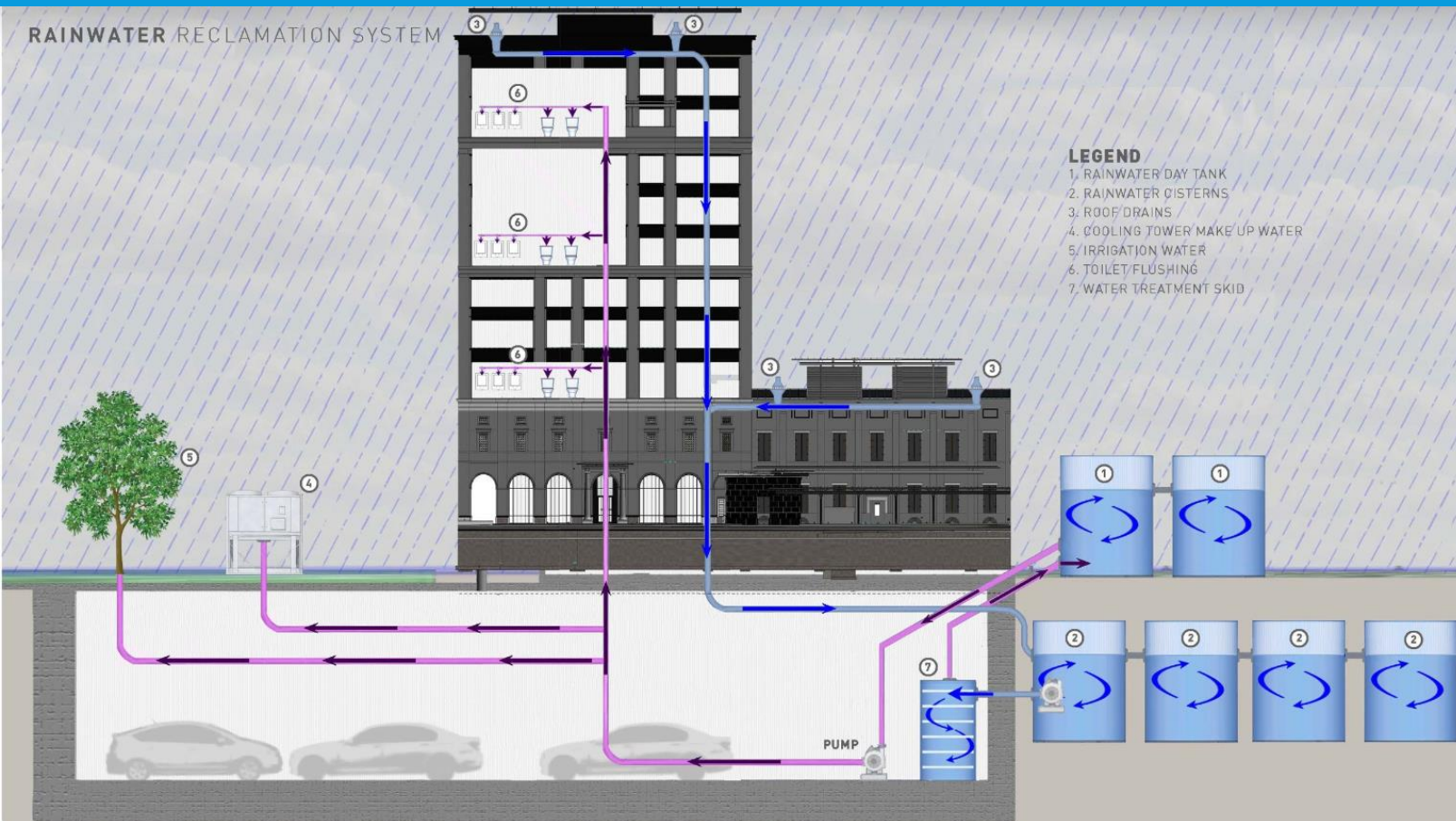
Dehumidification/Conditioning Coil



BUILDING AUTOMATION SYSTEM



AVOIDING 1.25M GALLONS OF H₂O/YR



Water Catchment Systems= 140,000 Gallon Capacity

80% of Runoff is Retained Onsite

Use of Grey Water for Toilets and Irrigation

Reduction of Cooling Towers from 6 to 2 Adds to the Water Savings in Addition to the Energy Savings



LARGEST PV ARRAY ON A BUILDING IN TEXAS



- 1 MW Installation
- Bidirectional panels on the edges
- Designed for 50% of Energy Usage

LIGHTING, PLUG LOADS AND SHADES



- Lights on Occupancy Sensors + Time Delay Off
- Work Stations and Desks are on Individual Circuits that are Shutdown in the Evening
- Shades Automatically Raise and Lower with Season and Sun Exposure

BENEATH ALL THAT BEAUTIFUL BRICK...



- Fluid Applied Air Barrier
- Continuous Insulation
- Thermally Broken Windows
- Interior Insulation

THEY TESTED EVERY BRICK TIE...

Crew was specially assigned but had never done this before.

Result: 0.088 cfm/ft² @ 75 Pa



Results

Depressurization Test	
CFM @ -75 Pa	13315 cfm +/- 1.2 %
CFM @ -75/Sq ft	0.078 +/- 0.001
Confidence Interval (for Depressurization ONLY test)	0.077 to 0.079
Correlation Coefficient (r^2)	0.9980
Depressurization Coefficient	944.2 cfm/Pa^n +/- 8.0 %
Depressurization Exponent (nD)	.613 +/- 0.021
Pressurization Test	
CFM @ 75 Pa	16768 cfm +/- 1.5 %
CFM @ 75/Sq ft	0.098 +/- 0.002
Confidence Interval (for Pressurization ONLY test)	0.097 to 0.100
Correlation Coefficient (r^2)	0.9967
Pressurization Coefficient Cp	1227.7 cfm/Pa^n +/- 10.1 %
Pressurization Exponent (nP)	.606 +/- 0.026
Average CFM75	15042 cfm +/- 1.0 %
Average CFM75/Sq ft	0.088 +/- 0.002
Target CFM75/Sq ft	0.25
Confidence Interval (for both tests) EqLA75	0.087 to 0.090
Pass/Fail Target Airtightness?	10.2 sq ft +/- 1.6 % Pass
Deviations From Standard	
*Depressurization test did not reach an induced building envelope pressure of at least -75 Pa	
*Pressurization test included an induced building envelope pressure less than +25 Pa	
*Pressurization test did not reach an induced building envelope pressure of at least +75 Pa	

HOW'S THE PERFORMANCE?

- 2% Premium on BAU Construction

- 13 Year ROI

Energy Stats



216,275 sq. ft. building

In Comparison



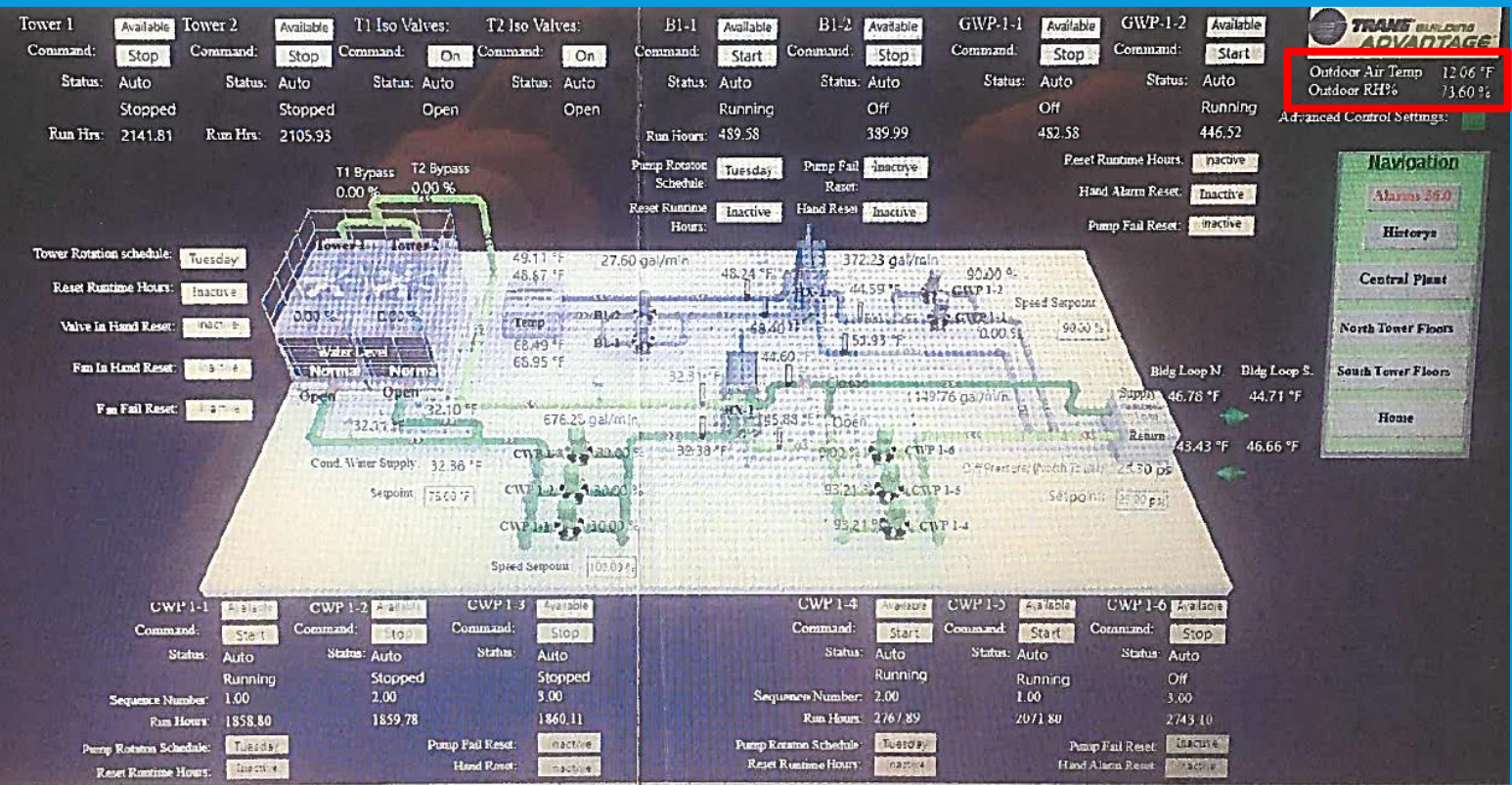
63 EUI = Median for similarly-sized buildings



New Building Institute's net-zero target for medium-sized office buildings *smaller* than Credit Human

* Based on energy data from February 2021 – January 2022

RESILIENCY IN ACTION: SNOWPOCALIPSE 2021



Ground Source + Envelope

- 12 °F outside
- Building is 68 °F
- Well Field 20 °F Lift

PEOPLE WHO MADE IT POSSIBLE



- American Construction Investigations
- ASSA ABLOY Door Security
- Cardno Haynes Whaley
- Don B McDonald
- Don Penn
- Earth Tech
- Glumac
- Kirksey
- Lerch Bates
- Mitsubishi Electric
- One80 Solar
- Pape Dawson
- Persohn/Hahn Associates
- Protection Development
- Raba Kistner
- Rialto Studio
- The Parking Advisory Group
- TSI Energy Solutions

Contractor
Joeris

Subcontractor

Alamo Door

Alpha Insulation

Alterman

Burditt Tile

Byrne Metals Corporation

Dynamic Systems, Inc.

Eilers Erection

Environmental Design

Hansco

J.E. Travis

Keystone

M&M Metals

Marek Bros.

Mesa Equipment Company

Mission City

Myrex Industries

NEC Signage & Architectural

AND WE'RE GONNA DO IT AGAIN...

This time in New Orleans.



Stay Tuned!