



POLYGON CASE STUDY – BAYLOR UNIVERSITY, WACO, TEXAS

SMART CLIMATE CONTROL FOR UNIVERSITY RENOVATIONS

Universities across the country aim to offer attractive residential and learning spaces to bolster enrollment and enhance student culture. Many older universities are tackling dormitory renovations to modernize buildings to today's living and technological standards.

However, while faculty, students and alumni expect their investment to deliver beautifully functional spaces, they also want to retain historical charm and overall building integrity. That means general contractors need to control the indoor environment to protect old and new construction materials alike.

Baylor University in Waco, Texas was facing a similar situation in 2023.

General Contractor, JE Dunn, was tasked with renovating over 70,000 square feet in Ruth Collins Hall, a dormitory in dire need of updates. Superintendent Adam Hammonds knew that drying the space to a specification at optimal rate would be a core component of the project timeline and job quality.



ADAM HAMMONDS
Superintendent at JE Dunn

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PROBLEM

Construction materials like drywall, concrete and paint would all introduce moisture into the building. Ensuring materials would dry on time and to the manufacturer's guidelines was a must. Quality and building integrity were important to him, his team, and to the owner so he conducted due diligence to find the best plan of action to climatize the space effectively. Relying solely on a rental equipment provider to control the temperature and relative humidity on the project would require sizing the equipment himself and pulling team members from their primary responsibilities to manage equipment. It

could also be a potential schedule risk because his team would need to take manual readings of conditions and adjust equipment as work moved from floor to floor. He estimated fuel costs to power the equipment to be over \$4000 per month and the project was expected to run for 3-4 months.

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KEY CHALLENGES

- Equipment runs 24/7 drawing excessive energy consumption from a rented generator
- Project cost, schedule, and quality must be balanced
- A viable solution for climatization and remote monitoring had not previously been implemented
- Limited manpower on the project
- Risk of project delays by 'self-performing' and implementing climate solutions
- No validation that conditions would be maintained during millwork or other high-end finishes

SOLUTION

Instead, the JE Dunn Superintendent consulted Polygon's Dallas team regarding comprehensive climate control options. Polygon walked the job to scope how to best climatize floors 2-5. To deliver the most efficient solution to mitigate the risk and achieve desired specs, the turnkey solution would require three key elements:

1. continuous monitoring of temperature and humidity,
2. right-sized climate control equipment, and
3. a smart controller to turn equipment off and on based on real-time data.



Polygon was confident the engineered solution would not only keep the space in spec and mitigate risk but would reduce energy consumption over time with significant cost savings to the client and the owner. Polygon rolled out the solution in two phases:

PHASE 1 AT WEEK 1

- Climatization for 4 Floors
- Deployment of (12) wireless ExactAire IAQ sensors (3) per floor and communications gateway
- Implementation of dehumidifiers and air conditioning units

PHASE 2 AT WEEK 5

- Implementation of automated energy management system
- Installation of ExactAire Smart controller for generator

The IAQ sensors provided the team with information on temperature and humidity so they could modify the space or work habits as necessary. The Smart Controller modulated the equipment based on data to truly control conditions in real-time. If one floor was too hot, the sensor data would inform the controller to turn on the AC unit. If a floor was too humid, the sensor data would tell the controller to turn on the dehumidifier. Once conditions reach a desirable state, the controller would turn off the equipment. Together, the client got a largescale smart thermostat system.

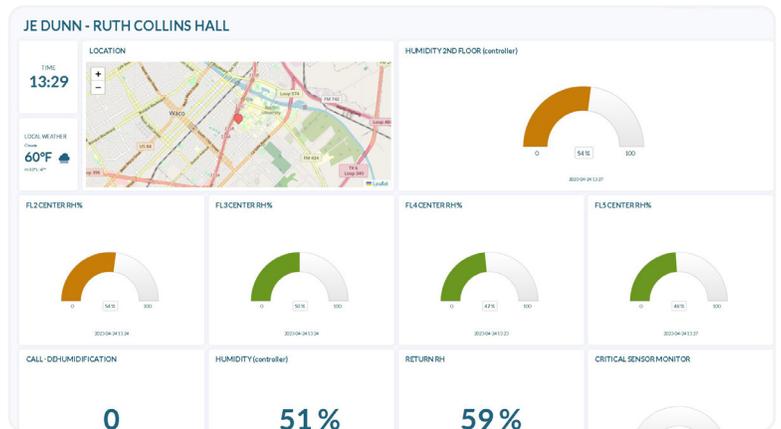
“The smart sensor technology so far has been incredible in the fact that you can set your own parameters and monitor/manipulate from a computer. This sensor, even only being on for about a week, will save the project 1000’s of gallons of diesel which is money saved as well!”

Adam Hammonds,
Superintendent at JE Dunn



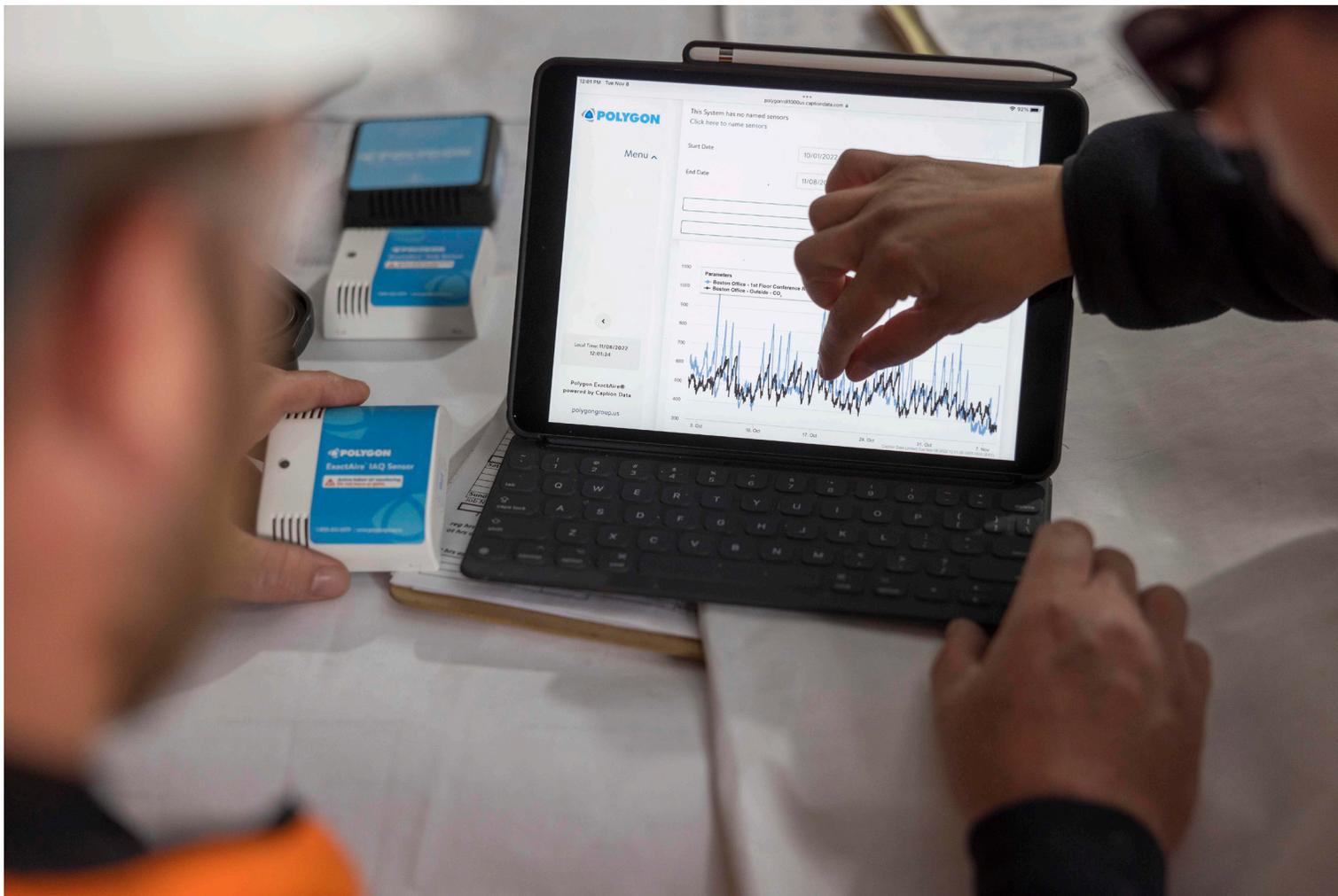
Throughout the project, the client was well-informed of conditions and any issues via SMS and email alerts, weekly reports, and dashboards. In instances, where a trade partner or project teammate might move a sensor, open a window, or unplug a unit, the client could remedy it before an issue arose helping them be proactive rather than reactive.

Additionally, project stakeholders gained a higher level of assurance that the project had minimal, if any, risk because conditions were being logged 24/7. The availability of reporting could become instrumental in defending material warranties or if required by insurance underwriters.



“The smart controller also is impressive in the fact that it has the capability to dictate if one or both of the units need to be running based on the parameters set on your dashboard, which also makes it even more cost effective.”

Adam Hammonds, Superintendent at JE Dunn



RESULTS

With Polygon’s three-pronged approach, JE Dunn was able to control their space to a greater extent and do so without using as much energy as anticipated. With variable weather conditions and indoor conditions changing, the equipment was required only at certain times.

In the chart below you can see temperature levels (blue line) dropping and the equipment utilization decreasing overtime. The green line represents when the dehumidifier was on, and orange represents when the generator was on.

Polygon was able to support the client in developing a solution that was just right for their project and needs. Polygon acted as a partner in crafting a system of systems and then provided onsite support to install and support equipment and interpret data. All this to protect the project materials, the building, and Baylor’s investment.

“With the weather being very moderate today, you can see that due to the smart controller, the sensors are not calling for the units to be turned on and therefore are saving fuel costs. By comparison, the onboard fuel tank for the generator holds approximately 250 gallons. Saving ¼ of a tank of fuel is 62.5 gallons and at \$3.22 a gallon, the smart controller has saved me \$201.25 in just 2 hours.”

Adam Hammonds,
Superintendent at
JE Dunn



KEY RESULTS

- More accurately control spaces using less energy and reducing fuel consumption and cost
- GC and trade partners gain visibility on project conditions and fuel
- Superintendent and Project managers receive real-time SMS and email notifications if conditions out of spec
- Project stakeholders receive automated reports and actionable dashboards with environmental trends, equipment status and fuel levels
- CG received a turnkey solution and operational support throughout the project allow them to focus on delivering quality result overall.



“

...on behalf of the Collins Hall Renovation team, Polygon has been great to work with. Everything from the friendly service to the innovative equipment you have brought out here, has been a very pleasant and pain-free experience.”

Adam Hammonds
Superintendent at JE Dunn

