



## THE WELLNESS-FOCUSED OFFICE

In June of 2017, Epsten Group, Inc. (EGI), began programming for a two-year planning and construction effort that culminated with the opening of our new office space at the Centennial Tower at 101 Marietta Street in Atlanta, Georgia. Totalling approximately 7,300 square feet in floor area, EGI's office holds the unique distinction of pursuing a total of five sustainability-related certifications.



Each certifications' technical and functional needs were interwoven with the equally complex technical and functional needs of any modern office space, producing a project that stands as a unique case study exploring the many facets of today's contemporary office environments. This paper intends to chronicle our design and certification team's experiences over the course of the project, the issues we attempted to address in our design and construction decision-making processes, and lessons learned from a wellness-focused office space.

## In the Beginning

When approaching the problem of creating a new office space for your business, there is certainly a level of convenience in your business having an internal architectural and interior design department. For our office, we had latitude to experiment with a broad range of options and their various implications for project cost and functionality.

***Our finished office represents a bold reinvention and reintegration of the conventions that ruled office design from its inception.***

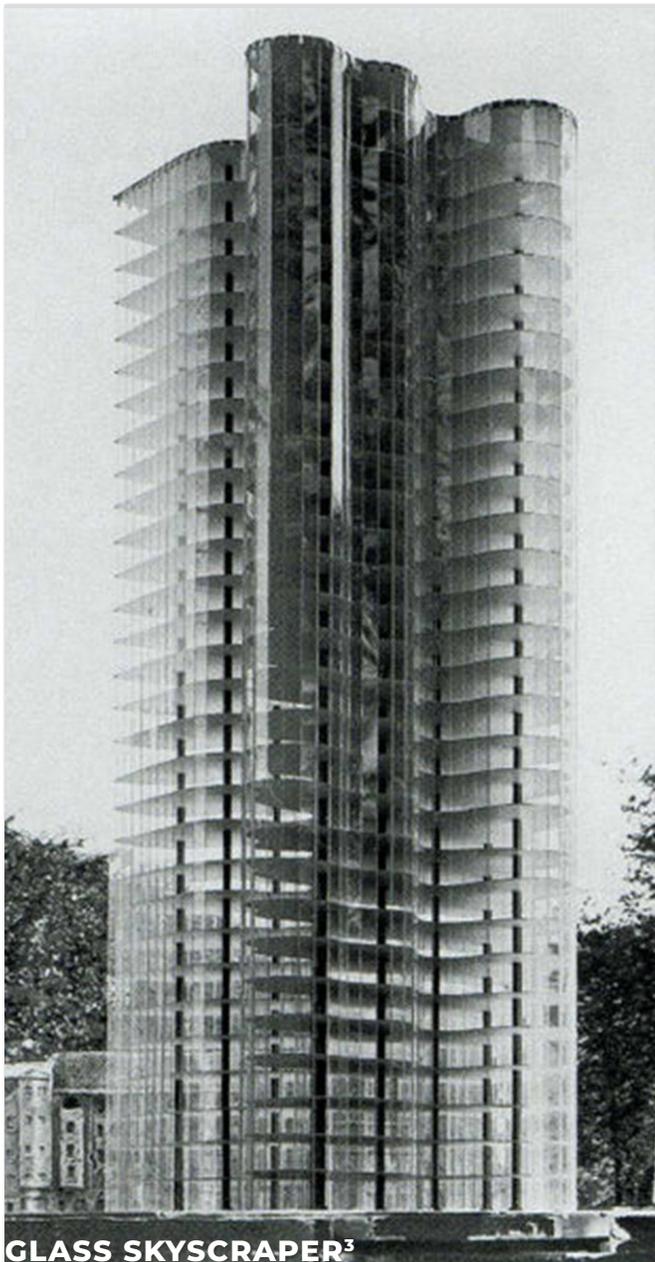
The office building of the last century primarily traces its origins back to the work of two men: American industrial engineer Frederick Winslow Taylor and German American architect Ludwig Mies van der Rohe. Taylor's *The Principles of Scientific Management* popularized an industrial management approach that emphasized efficiency by simplifying workers' roles and eliminating wasted time and motion. Taylor quickly turned his principles to the white-collar office sphere;

he is credited as one of the first people to design an office space.<sup>1</sup>

***The result: rigidly hierarchical office environments that dominated corporate culture through the 1990's and largely persist to this day.***

At roughly the same time that Taylor's writings revolutionized factory work with his "scientific management" processes, Mies van der Rohe was looking to exploit the tensile structural capabilities of steel structures. Mies was not the first architect to utilize steel to conceive a taller, more slender office tower. But they were still mostly clad in traditional materials and had smaller punched openings that limited the amount of daylight and views that these new buildings afforded their office workers.

In 1921, Mies published his concept for the “Glass Skyscraper,” a revolutionary tower with an all-glass façade, through which the building’s steel structure would be visible.<sup>2</sup> The design expressed itself as a lighter, more open and ephemeral structure.



**GLASS SKYSCRAPER<sup>3</sup>**

Guided by the twin principles of increased exterior building openings and Taylorist “scientific management,” the modern office building we know today largely came into shape. Executives began to occupy offices along the building’s exterior skin, where they enjoyed its better daylight and views. At the same time, junior staff were confined to free-span, open-office bullpen spaces around the building’s core.

***The concept of “the corner office” was born from the Taylorist hierarchy.***

This caste-style layout was further reinforced in a generation of workers who came of age through major conflicts like World War II, fully immersed in the culture of the military chain of command. Although Mies’ architecture freed the modern office from the constraints of the traditional building enclosure and maximized daylight and views, the modern worker was still constrained to a very hierarchical and siloed work environment for well over half a century.



WALTER HENN'S OSRAM OFFICES<sup>4</sup>

That's not to say that there weren't experiments giving workers greater choice and breaking down the walls between management and junior staff. In the 1960's , the Burolandschaft concept emerged in Germany and produced radical office layouts; office space consisted of massive free span open offices where workers could position their furniture and their working groups in any configuration they wished. Walter Henn's Osram Offices in Munich exemplified this concept. The completely free-form office environment aimed to improve office workers' social connectivity and base

layouts around flows of communication.<sup>5</sup> However, Burolandschaft was ultimately unsuccessful because the chaotic layout created massive inefficiencies due to poor wayfinding and incoherent circulation.

The concept of affording office workers greater choice wouldn't emerge again for another 30-40 years, when Silicon Valley technology companies began to experiment with space designs that aimed to improve the social connectivity of office staff.

By the time companies like Google famously started to popularize their more whimsical and playful spaces, some studies began to postulate that up to 90% of important communication in the office was taking place outside of formal communication mechanisms in informal spaces, such as “around the water cooler” or “around the copier.”

*The cloistered private offices of the Taylorist model were proving to impede creativity and collaboration that the tech sector desperately sought to spur innovation*

However, as they moved back to the opposite end of the spectrum toward completely open offices, studies showed that the lack of acoustic separation and visual privacy led to an unintentional decrease in worker productivity.

## Goldilocks and the Activity-Based Office

In astronomy, there is a principle surrounding the existence of a thin region of space around each star that receives just the right amount of light and heat to potentially nurture the development of life.<sup>6</sup> In economics, it's the optimal condition of simultaneously having moderate growth and low inflation leading to market-friendly monetary policy.<sup>7</sup>

In the design of our office, the Goldilocks zone would be the optimal balance between the opportunity for:



### Companionship

Adequate sizing, layout, and flexibility to allow for interaction amongst coworkers



### Control + Choice

Adequate provision of options for choosing preferred location(s) to complete individual tasks

The Goldilocks balance between companionship and control/choice in our office would provide consistent support for the fluctuating collaborative and individual work needs.

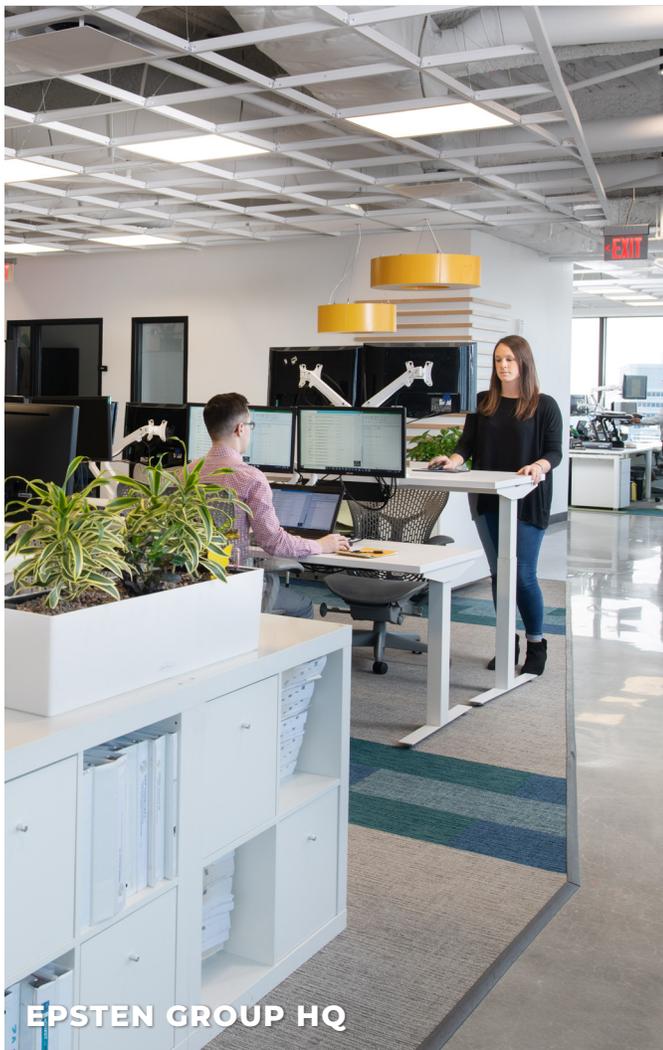


While our previous office space was Double-LEED Platinum under both the New Construction and the Operations and Maintenance rating systems, the overall layout left much to be desired. Our Operations and Design Department staff were cloistered in smaller, walled-off spaces on the first floor, while our Commissioning and Certifications staff worked in giant open-office spaces on the second floor. While the top floor layout afforded employees plenty of daylight and views, collaborative conversations frequently interfered with the contemplative, heads-down work of

others. As the company and our services grew, our Organizational Chart was much easier to massage than was our office layout. We lacked in spaces that allowed collaboration or focused work. The Certifications staff had permanent, assigned desks even though they also worked from home multiple days a week. And the Commissioning staff used their desk area to house more equipment than people. Unless the week called for design reviews, the Commissioning team was also absent most days while on jobsites.

Lessons learned from projects with our other clients layered on additional levels of detail to our conceptual design approach. Our work with a Fortune 100 Beverage Manufacturer headquartered in Atlanta in 2014 exposed how technology could be utilized to create greater mobility and collaboration for employees. For that client, we designed the marketing department's social media analysis lab that allowed workers the choice to untether from their traditional desks

and work wirelessly in a collaborative workroom with large monitors and specialized computing tools. The space had smaller formal and informal meeting spaces attached to it, and a small, enclosed privacy space for phone calls. In retrospect, this space was our first activity-based office environment. At the time, we were designing a space that responded to the appeal of an unprecedented level of choice. This approach is now widely referred to as Activity-Based design.<sup>8</sup>



Activity-Based offices recognize that there is no such thing as a perfect workstation. People have different work styles and personalities. While work tasks may range from conceptual problem solving to detailed technical work, the office space designs of the past were not a response to a work style or personality-type. With the current state of wireless technology, designers are able to untether workers from assigned desks and give them the freedom to choose from any number of different work environments.

## Common Office Concepts

<b>Library-type Environments</b>	A quiet place for focused-work requiring concentration
<b>Living Room-type Environments</b>	A variety of landscapes that allows for optimal productivity and smooth transitions between individual and group work
<b>Coffee House-type Environments</b>	The perfect blend of seating options that allows for mixed levels of concentration and socialization
<b>Playroom-type Environments</b>	Fosters communication and boosts social interaction between employees

Instead of a static mix of assigned workstations, the work environment becomes a more dynamic mixture of space types. Taken to its full realization, some Activity-Based office spaces have led to the abolition of the assigned desk altogether, substituting the somewhat negative connotation of the defensible space of a personalized workstation with the positive, affirmative ability to choose any work environment with laptop or tablet in hand.

There are limits, of course, to the applicability of Activity-Based office principles, which we acknowledged quickly in our office programming

process. As a multi-disciplinary firm, we understood that the workflows of our four main departments can be radically different, and therefore, required different functional approaches to space planning.

***In analyzing the companionship and choice/control needs of the various departments, we found it helpful to group them into three “neighborhoods”.***

## Operations Neighborhood



Our Operations staff must be present at the office each day (in a non-pandemic world) to provide support to the company in various administrative-related tasks. The companionship and choice/control needs were lower than for any other department. Due to the segmented nature of the department, the ideal workspace is largely a heads-down work model to

allow for concentration on tasks like financial calculations or responses to proposals. Therefore, assigned desks within an open office layout and private offices were arranged for this, our first neighborhood, following a traditional design approach.

## Certifications + Consulting Neighborhood

The companionship and control/choice needs of the Certifications and Consulting Department were unique enough for it to also be classified as its own neighborhood. This department primarily reviews digital documentation of built environments. Given the mostly digital nature of their work, this department has always been offered the flexibility of working remotely multiple days a week. Tailoring this neighborhood's space to workflows required consideration of the evolution in demand for in-office workstations throughout the week and access to a variety of meeting spaces.

With the increase in space types, our approach to the typical workstation was to provide compact, unassigned "hoteling" desks with sit/stand mobility and dual monitors on adjustable arms and laptop docking stations. Lockers were supplied for team members to store office and personal items since they do not have permanent desks. The needs of this team factored into the provision and layout of one large formal conference room and two smaller meeting rooms, as well as two meeting spaces for two to four people that are situated within their neighborhood.



## Design + Commissioning Neighborhood



The companionship and control/choice needs of our third and final neighborhood, comprised of our Design and Commissioning departments, was somewhere in between the other two. Given the overlaps between disciplines in these departments, as well as their common Goldilocks zone, a single neighborhood was both ideal and straight-forward. This neighborhood consists of an open workroom with assigned desks, sized for the outlaying of large sets of architectural drawings.

The directors of each department have private offices with direct lines of sight to their staff and a formal team meeting room in between for convenient use. Seat assignment follows a sort of Venn diagram approach with different teams within the two departments located for optimal collaboration, allowing them companionship with their contemporaries on either of the adjoining teams. True to the “neighborhoods” approach, spaces outside of this third neighborhood are also open and available.

## “The Glass is Hot Lava” + Other Basic Rules

It's important early on in any design process to identify the project principles and rules and to remain faithful to them all the way to project conclusion. For us, that meant treating the ample daylight and views afforded by the space as a shared amenity that would not be controlled or restricted by individuals and would be shared by all staff members. Through the push and tug of the design process, at times, principals and designers were tempted to push a meeting room or a private office to the periphery. That's when our egalitarian design principles found their ultimate expression in: “The glass is hot lava.” A particularly obstinate effort to abandon the principle received the hot lava admonition, followed with this reminder:

***“If you touch the hot lava with a wall, it'll melt, and we'll all be doomed.”***

Our strict enforcement of this rule was critical to the overall success of the

project. The daylight that bounces off the polished concrete floors in the circulation aisles adjacent to the perimeter glazing makes the entire space feel larger and brighter and affords all regularly occupied spaces a spectacular view.

Another rule we set and adhered to: private offices of managers must have direct lines of sight to their direct reports. This seems like a common-sense necessity for supervision, but it isn't necessarily always the case in many office environments, which can create some discontinuity between managers and the teams underneath them. In our new space, professional services managers always have visual and acoustic contact, making it convenient to talk through issues and fully integrate managers with the teams they're tasked with overseeing.

***There is a reciprocal accountability that comes with this arrangement, because staff can see into their manager's office, which puts positive pressure on managers to set a standard.***

As straightforward and common sense as these two rules are, all too often, design and ownership teams can stray from their principles by trying to force space programming to fit within a limited square footage or to meet other functional requirements. This can lead to a compromised end-product that doesn't communicate the architectural intent and provide the desired functional result.

***Were there contentious moments in the design process caused by telling some of the firm principals that their proposed changes wouldn't work or couldn't happen because they violated some of our preset rules?***

**Yes.**

***Were there bruised feelings on both sides of the table at times because of this?***

**Definitely.**

***Was it worth following through on the vision even in the face of stiff opposition?***

**Absolutely.**

With all design, but especially with office design, it's essential to establish the rules early and doggedly enforce and defend them.

A rule we make standard on all projects, including our own office design, is not letting the tail wag the dog. Sometimes, rules can clash with primary objectives. Throughout this office design, there were a handful of key instances where someone became attached to a product or finish, and we spent inordinate amounts of time trying to shoehorn it into the project.

For example, the goal of achieving Living Building Challenge Petal Certification led us to solicit Red List compliant materials, and when a composite wood flooring company offered us their product at-cost, we set out to find a way to incorporate it. There was the technical issue of the sleeper height needed to install the flooring over the concrete floors and how we were going to deal with the finished floor height transitions. Also, though it was a very nice product, even wholesale it had a higher price point than other, simpler flooring options, such as carpet or polishing the existing concrete.



Still, we spent weeks trying to incorporate this product into the project before finally abandoning it for a mix of carpet and polished concrete, the latter of which has been a hit with everyone involved in the project for the way it reflects natural light from the perimeter, making the space look bigger and brighter. While some of the design team knew scrapping the wood floor was the logical course the project needed to take to meet its functional,

aesthetic, and cost goals, we spent a lot of time trying to rationalize the use of a product because it met the requirements set forth in the Living Building Challenge. Never try to force a product, material, or piece of equipment into a project if it's not called for in the program or if there are options available that meet the specified requirements. The hassle rarely pays off.

## Design Walkthrough



The office space at 101 Marietta Street sits on the 26th floor of Centennial Tower. The suite wraps roughly the western half of the floor plate with fantastic views of Downtown Atlanta to the East, Centennial Olympic Park and Midtown Atlanta to the North, State Farm Arena and Mercedes Benz Stadium to the Southwest, and, out in the distance, Hartsfield Jackson International Airport and Georgia State Stadium to the South and Southeast. On a clear day, we can see the top of Kennesaw Mountain, located roughly 25 miles North of downtown. Our vantage point is one of the best in the entire city.



*Seating area off of the lobby highlighted by LightArt light fixtures*

*The Echo fixtures serve as a geometric focal point with notable acoustic properties, including a range of NRC values from 0.85 to 1.0 and efficient absorption components.<sup>9</sup>*





*The mural begins in the lobby and wraps the core of the office. Tellas, the muralist, was selected in collaboration with Atlanta's Living Walls.*



*A corridor to the right of the entry includes a Unisex Restroom, dedicated Nursing Room, and wall-mounted brackets for bicycle storage*



*Off the entry is our main conference room, The Benz. The series of tables on castors affords us flexibility; the tables can be configured into rows as a classroom or rolled out of the room completely.*





*Separating the Conference Room and the Operations Department neighborhood is a block of enclosed spaces that include a smaller meeting room and the Operations Director's office.*

*On the Conference Room side of this block, a pair of monitors display wellness information about the office space, including walkable amenities near the building and the aggregate air quality statistics being measured by the Tongdy monitors located throughout our space as a part of the RESET program.*





*The Kitchenette and Break Room serve as the pivot point in the design, as the floorplate turns from the northeasterly view of Downtown to the westerly view of Centennial Olympic Park. The centerpiece of the Break Room is a waterfall high-top bar.*



*The perimeter of the room has a mix of soft furnishings and bistro tables to complete a coffeehouse vibe for the space.*



*The corridor wall features a 4-person Huddle Nook, a 2-person Heads-Down Room, and a Wellness Room with sliding glass doors and culmination of the office mural.*

*The Wellness Room is intentionally screened from the open office area by a wall of lockers. This natural screen allows anyone using the space to not distract others when using the colorful LED lighting, Bluetooth speaker, or aromatherapy device.*





*In each neighborhood there are worktables separate from the traditional desks that feature a pair of overlapping Light Art halo pendant fixtures, adding even more options for workspaces, group collaboration, sit-stand orientations, and lighting levels.*

## You Want to Do How Many Certifications at Once?!

Since its inception in 1991, EGI has been organized and built around the precepts of sustainable design and construction.

*Our goal for the last decade has been to develop a unique company that offers services for all aspects and phases of a sustainable building project.*

What began as a humble residential architecture practice blossomed over the last fifteen years into a commercial architecture and interiors practice that offers numerous other sustainability-related services, such as consulting and auditing for nearly all major sustainability programs originating in North America, comprehensive energy modeling, environmental life-cycle assessment, building systems commissioning, building enclosure commissioning, building enclosure testing, and more.

*True to our nature, we sought to “walk the walk” when it came to the design and construction of our own office spaces.*

Epsten Group’s previous two offices were both high-performance, sustainable buildings. Our first office space at 429 Edgewood Avenue was the first LEED Platinum building inside the City of Atlanta in 2007 and included many new, sustainable features, such as a rainwater capture cistern that was used for irrigation and water closet flushing, as well as a green roof system. When we outgrew that office space, we chose to renovate another historic, existing building just down the street at 399 Edgewood Avenue. Again, we set our sustainability sights high. That project achieved LEED 2009 BD+C: NC New Construction Platinum and Four Green Globes, later achieving “LEED Double Platinum” status by certifying under the LEED v4 Operations + Maintenance Rating System.

*The 399 Edgewood building had a green roof system and a 5-kW thin-film photovoltaic system that offset 7% of our overall energy use.*



We soon outgrew our second space and set our eyes on relocating once more. By that time, our services had expanded to include additional rating systems that had come onto the market since 2011. With our extensive experience on projects seeking multiple certifications, our new space was a prime opportunity to explore in depth the overlaps amongst the multiple rating systems with the goal of creating fewer documents that demonstrated we met the program requirements across all rating systems.

We identified LEED, WELL, and Materials Petal Certification as our certification

goals. From a design standpoint, we wanted to prove that certification under all three rating systems could be achieved without a limitless budget. We wanted to speak to clients from personal experience how to integrate the aspects that matter most, based on their goals, culture, and budget, into multiple certifications at once. Along the way, we upped the ante and added two additional certifications to the docket: Fitwel and RESET Air. While we cannot fully rule out that another entity somewhere may have also set out to achieve a total of five certifications in one go, to the best of our knowledge, we are the first.

## The Rating Systems Tried to Bury Us, But We Were Seeds

With five rating systems focused on optimizing efficiency and occupant health and wellbeing in the built environment, there will be redundancy. Our premise was that it is possible to pursue five certifications at once, and that the successful process will ensure that no one is doing more work than is necessary, as well as find the shortcuts and overlaps to save time and, in the end, money. We can now tell our story, from one owner perspective to another, as well as provide the same service to clients interested in pursuing multiple certifications simultaneously.

For any rating system, nothing has the potential to prove your theories wrong like true performance, i.e., measurable

outcomes, such as the actual sound transmission through constructed walls, the true indoor air quality from a low or no volatile organic compound specification set, or the measured equivalent melanopic lux of a lighting design. While not the most challenging to incorporate, adopt, or design within a new construction project, the WELL Building Standard and RESET Air certifications have proven the greatest accomplishments to check off our long list due to the requirement for actual performance.

*In touching on a couple tales of our greatest barriers, proof emerges that, even with the added challenge of performance-based standards, where there is a will, there is a way.*



LEED



WELL



LIVING  
BUILDING  
CHALLENGE™

Materials Petal



Fitwel



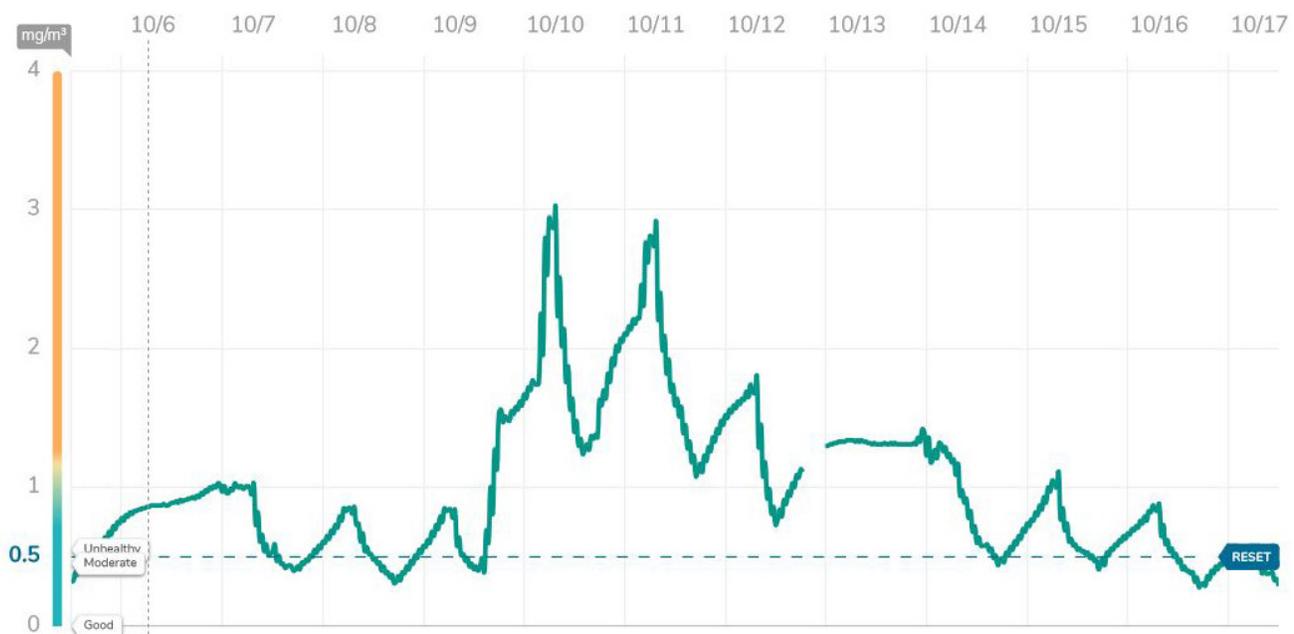
RESET Air

As a fit-out project within a core and shell building, we encountered unanticipated performance-related challenges. As WELL Performance Testing Agents, we can test our own spaces to the same rigor of WELL Performance Verification for every aspect. We tested air quality before, during, and after construction to create baselines and to assess the air quality the construction team was exposed to daily. The baseline contaminant levels were low or non-existent for particulate matter, carbon monoxide, nitrogen dioxide, ozone, and VOCs.

During construction, between the air ventilation system filtration and our low- to no-VOC specifications, VOC levels remained low, while a minimal demolition scope kept particulate matter levels low. A few months into partial occupancy of

the space, we noticed a sudden increase in VOC levels on our RESET Air monitors that were noted but were not high enough to curb our certifications. We linked this increase to construction in adjacent tenant spaces.

Even after the neighboring space construction was complete, we saw higher VOC levels, presumably a result of the continued off-gassing of the wet-applied products and new furniture traveling through the shared air system. However, not long after reaching full occupancy, the base building common corridor was painted, and the VOC levels more than rose; they spiked. Then the corridor received new wallpaper, and we saw a major spike. And soon enough we were seeing new spikes almost daily.

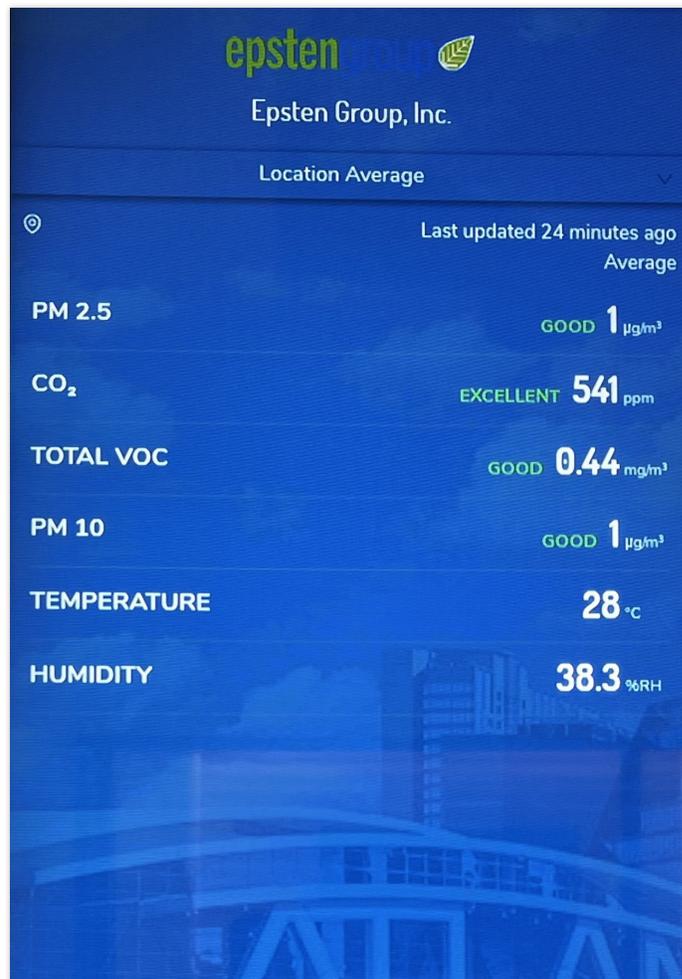


VOC level daily spikes during construction

It wasn't until we met with the base building engineer and better understood the 1970's air ventilation design that we fully appreciated the air quality challenge we faced. Make-up air in the Centennial Tower travels through the elevator shafts. While our bank of elevators only accesses the 20th floor to the 35th floor, one of these is the service elevator that accesses every level. As a result, we share air with every floor. Therefore, when five floors are under construction, we have high VOCs. When the 20th and 16th floors get new coats of paint, we smell the paint fumes in our office. And when another office undergoes electrostatic spraying to combat coronavirus, the disinfectant causes spikes in our VOC levels. Activated carbon and HEPA filters installed throughout the office helped at first, but these filters alone could not adequately mitigate what was happening outside of our space. In August of 2020, more than one-year post-occupancy, we decided to apply an innovative photocatalytic product to our exterior glazing. Pureti, the VOC-eating monster, has been hard at work ever since, utilizing UVA light from the sun to oxidize our VOCs.

Our RESET Air monitors are tracking the progress, and while still not down to zero, the VOCs dropped to half the allowable levels within days.

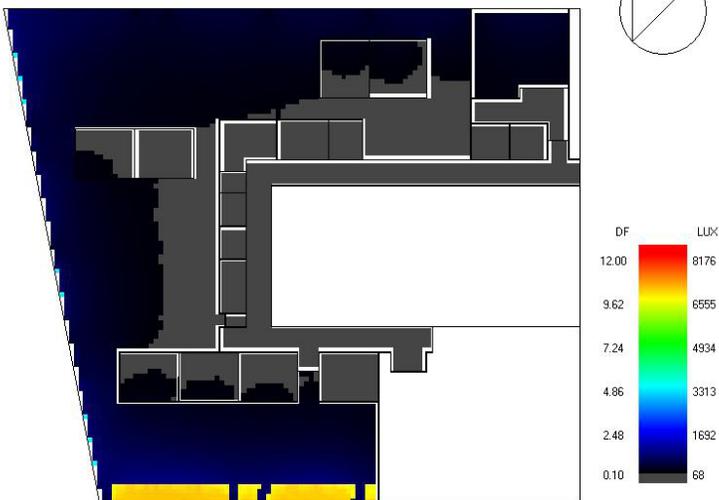
***We finally feel it is safe to move forward with WELL Performance Verification testing, but more importantly, we know the air in our space is safer for our occupants.***



Lux levels at 9am



Lux levels at 3pm



What our Lux levels *should* look like



The 26th floor of the Centennial Tower has magnificent views with nearly floor to ceiling glazing, and a cut sheet for the curtain walls revealed that the visible transmittance for the glass was 55%. However, in a small box in the corner of the cutsheet was a note: visible transmittance with window film – 13%. Views for days, but quite literally, zero lux.

Actual measurements on September 21st at noon found lux levels to be slightly higher than our model (likely due to degradation of the film over the last 50 years), though the actual lux was still nowhere near the levels we needed to meet either the WELL or LEED requirements.

There is a reason the LEED rating system, regardless of iteration, has always emphasized the importance of daylight. Beyond the energy savings achieved by reduced reliance on electric lighting systems are the human health considerations, which is how the WELL Rating System outlines the importance of daylight.

***Human circadian rhythm centers around daylight; a lack of daylight can disrupt our sleep patterns, our alertness, our digestive systems, and a whole host of other functions our bodies need to thrive.***

Thankfully, modern lighting design lighting design can help any space achieve an equivalent daylight scenario while still curtailing reliance on energy systems. Color quality and hue that can only be achieved through LED lighting can also produce an equivalent melanopic response needed to enact circadian rhythm.

Our lighting was carefully selected to ensure that the color rendering index (CRI) was 85 or better and Kelvin levels were between 3,500 to 4,000 degrees (natural sunlight has a CRI of 100 and Kelvin of 5,000). The white surfaces of our desktops also help to reflect the light within the space. Though LED lighting is normal these days, the specifications for our system are above average.

The LEED v4.1 ID+C rating system requires lighting systems to meet 0.35 watts per square foot, and the LED lighting helped us beat these requirements, but the requirement for daylight controls for the lighting system was still a challenge. After some back and forth with the team at USGBC and GBCI, they agreed that providing daylighting controls for a space where daylight would have no effect on the amount of light coming into the space was redundant. As a part of our LEED application, we will provide the documentation showing our modeled daylight levels and our measured daylight levels to support our argument for parting with the mandatory daylighting controls outlined in the ASHRAE Standard 90.1-2016.

## Fitwel v2.1 for New Commercial Interiors

Do not underestimate Fitwel v2.1. While there are no requirements to enter the market with Fitwel, the rating system and its documentation requirements were more rigorous than expected. As a matter of fact, the Nutrition section for Fitwel drove the requirements outlining our own Catering Policy, as the requirements from Fitwel covered the WELL requirements and then some. And, while Fitwel markets itself as a health and wellness rating system that is easier to enter by eliminating the need for preconditions or prerequisites, location and size will drive how many points you are eligible to earn under Fitwel.

There were certainly some details that we did not understand for specific credit requirements until we received feedback on our application. As a rating system that did not include a guidebook or manual when we attempted certification, we assume we are not the only project that fully understood the requirements until after they were implemented.

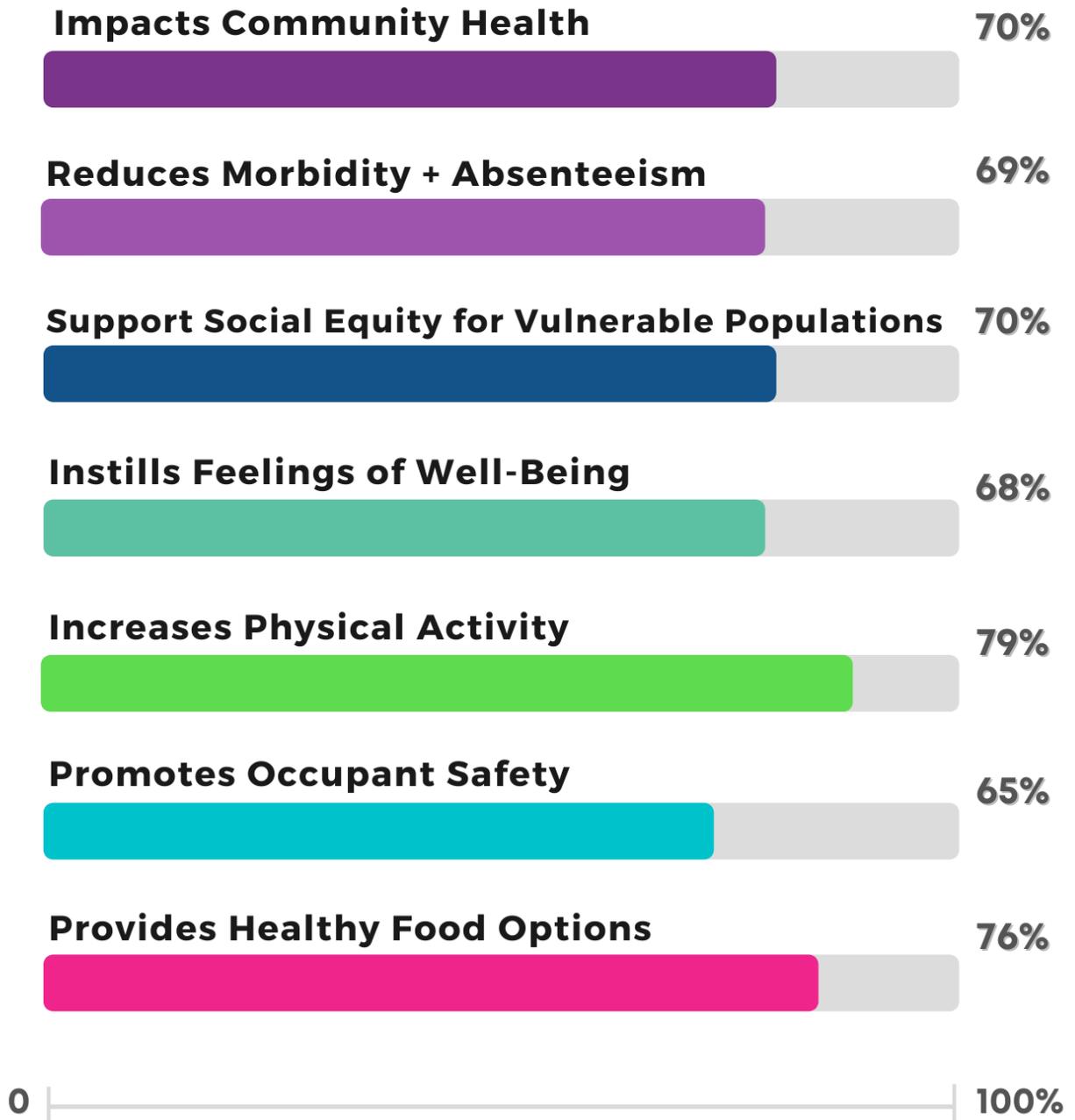
*For our own office, we were not eligible for enough points to earn the top tier of three Stars, because we do not have multiple floors and we do not provide food for our employees in the form of a cafeteria, café, or vending machines.*

However, we earned exceptional marks for our office location, which is another main driver for the rating system. The area surrounding the 101 Marietta Street office tower has a Walk Score of 90, access to multiple forms of transit, multiple parks that offer places of respite or exercise, dedicated bike lanes on major roadways, and plenty of amenities within walking distance or in the building itself. While we certainly sought out these amenities for our employees when we sought out a new office location, we did not look to the Fitwel requirements as a guide. For the first certification we submitted for review, we earned 2 Stars.





## Health Impact Categories



## Living Building Challenge v3.1 and the Materials Petal v4.0

Allow the Red-List Imperatives to drive your entire design, and be prepared to hold your construction team accountable. We have had the pleasure of working on two other Living Building Challenge projects prior to embarking on our own journey, and while the rating system has grown over those years, the challenge is still difficult. After all, it is the only rating system that makes every imperative a requirement to achieve. And since the Living Building Challenge speaks to both efficiency and health and wellbeing, there are a vast number of overlaps with other rating systems. From a design to market standpoint, there are certainly many hurdles. It is the only rating system that, with each iteration, includes paths to overcoming these challenges, or a reduction in the requirements.

For example, the previous iterations required that 100% of the products installed on the interior and exterior of the building be free of red-list chemicals. When the design community attempted the challenge and provided feedback indicating that there weren't materials available that allowed a project to adhere

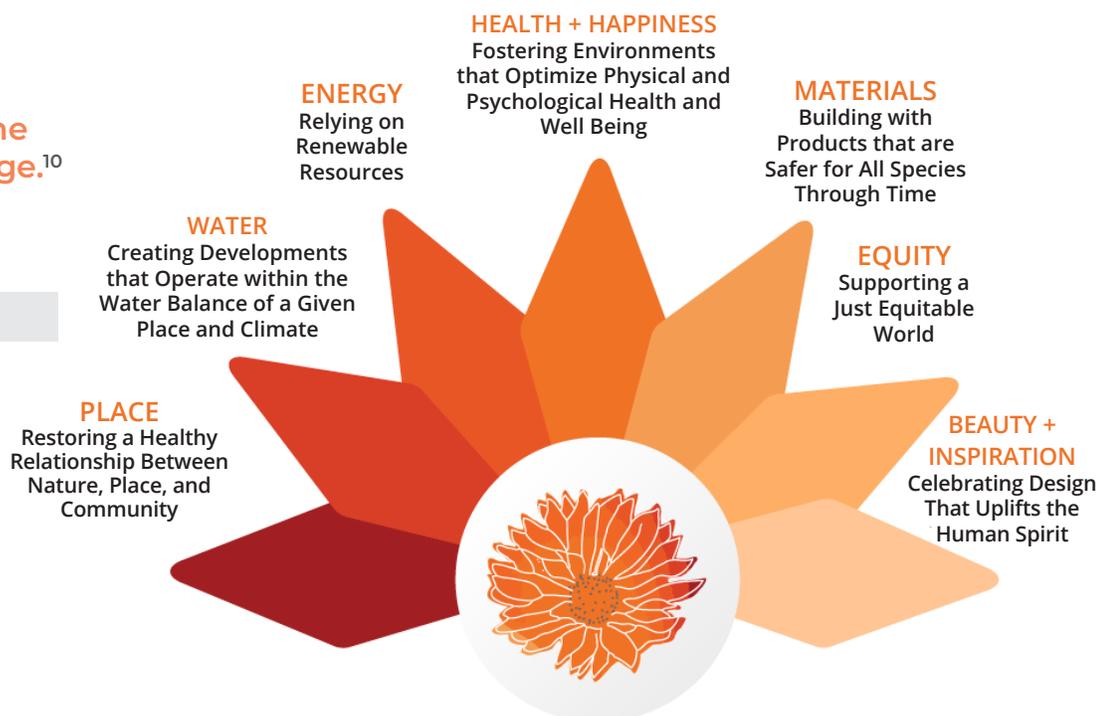
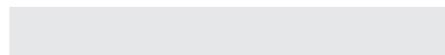
to this requirement, advocacy to the materials industry asking for red-list free products became an acceptable alternative, and the project still earned certification. Now the requirement is 90%, but not because the market hasn't shifted. The requirement for 90% is to reduce the amount of overall tracking that is involved. Can you imagine needing to verify whether every hook, nail, screw, hangar, or bolt was free of red-list chemicals? Or, in most cases, whether the previously approved "Exemption" involved hooks, nails, light switches, fixtures, etc.?

The number of resources and products available has grown substantially since we first took on a Materials Petal project in 2012, making our work a bit easier than before. Though, true to our own nature, we asked for permission to attempt a version of the rating system that did not yet have published guidance or resources. A few steps forward, and a few steps back. And in terms of design, our Architect was given very clear guidance – chose only products from the Declare database, with a preference for those that are Living Product Challenge certified and Red-list free.

Lucky for her, that database has grown. Unlucky for us, not all materials needed for an interior fit-out exist within the database. And in some cases, while the Red-List free product may exist, because our space is only 7,200 square feet, several manufacturers would not sell us their red-list free product. To their credit, some manufacturers have achieved the demand to remove harmful chemicals from their products using the same manufacturing line as their typical product. Changing entire manufacturing lines or sourcing new suppliers is both costly and arduous. As the sustainable design community advocates for change, the manufacturers say that not enough people are specifying their sustainable product to warrant the necessary investment. When a customer doesn't

need as much of the material, or in quantities like what is produced when the manufacturing line is switched, the customer is left empty-handed. In addition, the manufacturer of the Forest Stewardship Council-certified doors we had specified initially would only ship a larger quantity to Atlanta than what we needed. So, size does matter in the sustainability world. Many manufacturers say that the red-list free material does not have the same lifespan as their typical product. Many of the specialized chemicals that are harmful to humans are the same ones that deliver higher performance and extended warranties. Therefore, producing mass quantities of the red-list free product to be stored in a warehouse is not an option, and, again, there isn't enough demand to drive the

**The seven different performance areas of the Living Building Challenge.<sup>10</sup> Our office achieved Materials Petal v4.0.**



## RESET Air v2.0

*Your business-as-usual design is negatively affecting the air quality in more spaces than one.*

While lesser known in the North American market, RESET Air is in its second iteration as RESET Air v2.0. The RESET rating system outlines where and how many monitors to place in your space, as well as the air quality targets and items to monitor. RESET Air prequalifies widely available air monitoring devices. We chose the Tongdy air monitors due to their ability to be hardwired, connect to the QLEAR platform, and anticipated lifespan. In conducting our thermal tests, we noticed that the Tongdy monitors reported higher temperatures than what we saw in our analysis. We decided to place HOBO monitors from our Commissioning Team, where all our Tongdy monitors

were located for an entire month. The temperature readings from the HOBO matched the readings we had during our WELL Performance Verification pre-tests. Upon further inspection, we determined that the thermal sensors in the Tongdy monitors are placed too close to other heat sources, and it has skewed the readings.

Due to the issues we have had with the presence of VOCs coming from other spaces, we have not been able to secure our RESET Air certification by passing with three months of data in the appropriate air quality levels. The RESET team has conducted case studies on similar issues, so there are multiple levels for achieving RESET Air certification. We are proud to say that our office has achieved RESET Accreditation, but we are hopeful that we will soon be able to say we are RESET Certified.

PM2.5 Particulate Matter	TVOC Total Volatile Organic Compounds	CO <sub>2</sub> Carbon Dioxide	Temp Temperature	RH Relative Humidity
Required ≤ 12 µg/m <sup>3</sup> or ≥ 75% Reduction*	Required < 400 µg/m <sup>3</sup>	Required < 800 ppm	Monitored	Monitored
<i>Although there are no requirements for temperature and humidity under RESET Air, both must be monitored given their impact on sensor readings for PM2.5 and TVOC.</i>				

For a project to achieve RESET™ Air Certification for Core & Shell, indoor air quality parameters must be maintained within these limits above for three continuous months.<sup>11</sup>

## LEED v4.1 for Interior Design and Construction

*As a reflection of the market overall, LEED is by and large the rating system that we know inside and out, forwards and backwards.*

Our casual conversations sound like technical writing and some of us will admit that we have memorized sections of the rating system and their referenced standards. It's okay; we know we are nerds, but we do it all with passion. As the beta version of a rating system, LEED v4.1 was intended to provide some relief for credit requirements and some challenges for others in a response to the global market. Most projects choose to insert the requirements for v4.1 into their v4.0 project, but no – not us. We wanted the whole beta, all the guesswork, and none of the resources. But what we really wanted was real time feedback. What does a project look like when LEED continues to push the marketplace; no longer riding that supply and demand line, how far can the rating system go before we as designers have to sit back and figure it all out again?

Our typical design strategies that mitigate sound barely worked for the higher LEED requirements forcing us to install sound buffers in a few spaces. We narrowly met the energy demands due to our lighting design, whereas most curtain wall projects use fewer fixtures by maximizing access to high lux values. We worked with building management to replace their baseline restroom fixtures to avoid negative water savings even though our gender neutral restroom has a waterless urinal, 1.0 gallon flush toilet, and an ultra low flow faucet.

Our scope of work meant that we left points on the table in LEED Energy and Atmosphere, but the effort we put into finding the right location more than paid off in Location and Transportation. While we did not earn LEED Platinum this time around, we will use the crosswalks we earned through our LEED v4.1 ID+C Gold certification for our WELL Platinum application, knowing that our space surpasses the requirements outlined in WELL.

## Whole Building Life-Cycle Assessment for LEED

The results of the study demonstrates that our office has a reduced impact in all six categories assessed for the LEED rating system. Significant reductions in each category are related to the use of products with reuse of FF&E products, and a better environmental impact than those used in a baseline building.

Impact Category	Baseline	Proposed	% Change
Global Warming (kg CO <sub>2</sub> e)	8.846x10 <sup>4</sup>	6.4x10 <sup>4</sup>	-28%
Ozone Depletion (kg CFC11e)	3.247x10 <sup>-3</sup>	3.239x10 <sup>-3</sup>	-0.2%
Acidification (kg SO <sub>2</sub> e)	6.148x10 <sup>2</sup>	5.471x10 <sup>2</sup>	-11%
Eutrophication (kg Ne)	1.8887x10 <sup>2</sup>	1.833x10 <sup>2</sup>	-2.9%
Tropospheric Ozone (kg O <sub>3</sub> e)	4.62x10 <sup>3</sup>	3.636x10 <sup>3</sup>	-21%
Nonrenewable energy (MJ)	4.781x10 <sup>6</sup>	4.191x10 <sup>6</sup>	-12%

## WELL Building Standard v2.0

From a design perspective, the challenges WELL presents are those design elements every architectural intern wishes for from a client.

***The other two-thirds of the rating system require us to work with people we never used to encounter as a design team: human resources.***

The policies and procedures presented in the rating system aligned well with our existing policies. While our policy manual has never been more robust, knowing we have to hand over proof that we follow our policies set forth every three years to recertify under WELL created a challenge. And while we have never had to recertify a new construction project, our work with the LEED Operations and Maintenance rating system has taught us that documentation is everything. Forming a Wellness Committee to ensure we documented how guidelines are followed and policies are enacted made perfect sense. However, for larger companies or spaces, this requirement could easily prove to be a much more complicated task. There is not much

overlap in documentation for this rating system, but there are many strategies that overlap. For example, our RESET Air monitors will plug into our WELL rating system to provide the feedback required on air quality when it is time to recertify. To meet the air quality requirements in WELL, a third-party will take air samples in our space to determine exactly where we fall for specific elements. Through our feedback channels with the team at IWBI, we understand that it is a goal for IWBI to present more opportunities for such overlaps in the marketplace.

For most features that do not involve performance verification or a policy manual, a form must be signed to attest that the requirements for WELL are included in the project; therefore, much of the documentation for WELL just isn't required for other rating systems. Our Pureti product will need to be reapplied before our recertification. We are not naïve enough to think that our air system will be overhauled or our neighbors will stop introducing VOCs into the building. Our documentation that overlaps with the Fitwel requirements has already been vetted with the Center for Active Design, so we are crossing our fingers that GBCI will find the WELL requirements have been met.

## Our WELL Performance Testing Agents taking air and water samples for our office



## At the End of the Day

***Continuing our commitment to a more prosperous and sustainable world was a given.***

***Providing our employees with a lactation room, a wellness room, free address, sit-stand desks, clean drinking water, and healthy snacks already felt like we were giving back.***

The Living Building Challenge and LEED help explain how the built environment looks to make the world more sustainable, more prosperous. Certifying under WELL, Fitwel, and RESET was meant to tell people outside our company that we invest in our people. We know the reasons behind the why when it comes to investment in employees. Providing a healthy workplace, even if no one talks about it, is a display of compassion for the employees who give their all to a company and its clients.

Given the rigor of the rating system, we hear all too often that projects may consider the requirements of one system, but they won't seek certification. From our

own experience, it is the rigor of moving through the rating system, creating the documentation, and then displaying the results that has made our employees aware of our commitment to these goals more than it has for people on the outside looking in. From the Certifications and Consulting department, we forget that the other half of the employees aren't used to seeing what these rating systems require, produce, and maintain.

***Not all of our designs look to achieve these rating systems, not every commissioning project involves a green building certification, most spaces, healthy or not, have envelope issues sooner or later, and no one attempts five certifications – that's just us.***

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