

Achieving the WELL Building Standard™

Center for Sustainable Landscapes
Phipps Conservatory and Botanical Gardens
Pittsburgh, PA
A WELL Platinum Pilot Certified Project



GREEN BUILDING TOOLKIT SERIES





Project Overview

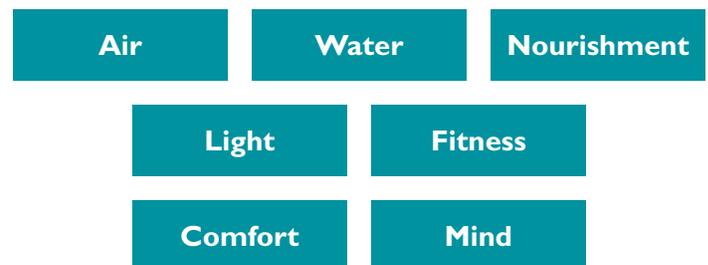
With the Center for Sustainable Landscapes (CSL) — a 24,350 square foot education, research, and administration office facility which opened in December 2012 — Phipps Conservatory and Botanical Gardens seeks to reveal and celebrate the important connections between human health and ecological health. Phipps believes that buildings should be developed with people’s health and wellness at the center of design. Indeed, the CSL challenges the perceived mutual exclusivity between built and natural environments with a design that is sensitive to nature while meeting the highest standards in well-being for all occupants and visitors.

A model for sustainable design and operations, the CSL is the first institution worldwide to achieve WELL Platinum Pilot Certification – the highest rating awarded by the International WELL Building Institute (IWBI), which it achieved in October 2014. Built on a remediated brown-field site and seamlessly integrated into the guest experience at Phipps — a 120-year-old institution with nearly half a million annual visitors — the CSL, which also achieved full petal certification of the Living Building ChallengeSM (LBC), LEED® Platinum, and 4 Stars Sustainable SITESTM, is uniquely positioned to demonstrate the highest standard for creating spaces and communities that are healthier, richer and more supportive of all life and inspire a reconnection to nature.

WELL Certification Process and Wellness Scale

The WELL Building Standard is a performance-based certification system that focuses solely on the health and wellness of building occupants. The standard incorporates performance metrics, design strategies, and policies to elevate human health in the built environment by improving the health, comfort, and knowledge of building occupants. It is based on existing research and verified through scientific and technical review. For more detailed information on the WELL Building Standard, visit www.wellcertified.com.

The WELL Building Standard Pilot Program, under which the CSL was certified, included seven concepts and 60 features. The WELL Building Standard v1.0 expands the number of features to 105. The seven core concepts are:



Each of the WELL Building Standard categories contains a number of features that are either required (preconditions)

or optional (optimizations). Achievement within each of the categories is weighted on a Wellness Scale from one to ten. The lower the level, the lower the potential for occupant wellness. WELL certification requires that a project achieve a passing level in all seven categories as determined by the IVBI. In general, performance tends to outweigh the mere inclusion of features. The first four levels of the Wellness Scale (1 – 4) depict a design where the conditions may be unhealthy for building occupants. Levels 5 – 10 are projects that can be WELL Certified.

All preconditions are required to be implemented to achieve WELL Building certification. The number of optimizations successfully pursued corresponds to the certification level. A score of either 5 or 6 is considered base (Silver) WELL Certification. No optimizations are required at this level of certification. A score of either 7 or 8 qualifies a project for Gold WELL Certification and symbolizes that some, but not all, of the optimization features have been met. A score of either 9 or 10 qualifies a project for Platinum WELL Certification and is reserved for projects that have complied with the majority of the features.



Verifying Compliance

To verify compliance with the WELL Building Standard's requirements, projects must submit documentation showing successful implementation of design parameters as well as undergo a thorough on-site performance audit. The WELL Building Standard is primarily performance driven; compliance is determined through empirical measurements in lieu of prescriptive strategies wherever possible. The WELL audit measures conditions in air, water, light, thermal comfort, and acoustics, among other parameters, to ensure that the building is operating as required for WELL certification.

The WELL audit is a measure of environmental conditions over a limited snapshot of time. The WELL audit team uses professional judgment to determine whether their findings can be applied over longer periods of time, or whether they were a result of a temporary environmental condition. In most cases, the WELL audit results are representative of the overall performance of the space and will be used to confirm compliance with the WELL Building Standard. IVBI encourages all of its projects to frequently or continuously monitor environmental conditions so that adjustments can be made as needed.

Phipps staff provided extensive information to the IVBI about the CSL, including the following:

- LEED and LBC submittal, audit, and scorecard documentation¹;
- Design drawings (including floor plans, mechanical drawings, and lighting and furniture specifications) and construction documents;
- Construction and equipment specifications;
- Internal policy documents; and
- Specific reports/data (e.g., lighting study, post-occupancy evaluations, comfort surveys).

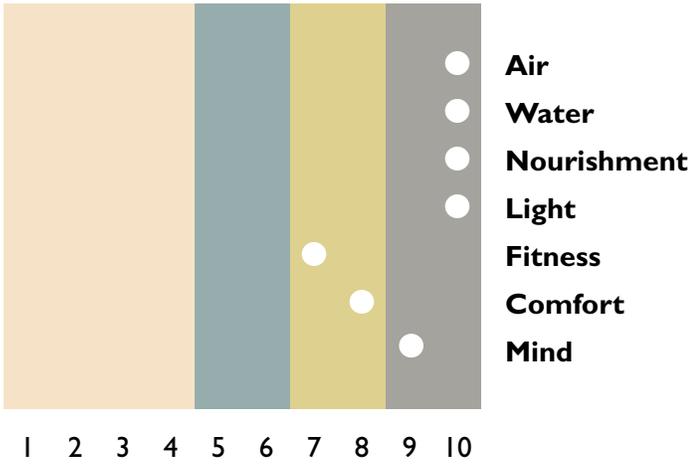
To maintain certification, projects must undergo a recertification exercise every three years, demonstrating compliance with the current version of the WELL Building Standard in order to ensure ongoing performance of the project features.

Did You Know?
A WELL Certified project must be recertified every three years to ensure ongoing compliance.

WELL Scorecard

The Wellness Scale on the next page depicts where the CSL rates for each of the seven categories of the WELL Building Standard. As shown, the CSL complied with all precondition features and sufficient optimization features to qualify for the highest level of WELL Certification, **WELL Platinum Pilot Certified**.

¹ Some requirements for WELL Building certification parallel those required for LEED and Living Building Challenge certification. The features required under each certification are intended to complement, rather than duplicate, each other. Successfully meeting related criteria under one standard frequently sets a project up for achievement of credits in the others.



standard’s requirements was uploaded for IWBI review. An extensive on-site performance verification audit was conducted in March 2014 and included a thorough walk through of the building and measurement and evaluation of environmental performance as appropriate. Three months later, in June 2014, Phipps received an audit report that documented project compliance and included recommendations to reach higher levels of certification. As a result of the audit, Phipps implemented the suggestions in the summer of 2014 to achieve additional optimizations. Additional documentation about these optimizations was shared with IWBI in September 2014 and in October of that year, the CSL was awarded Platinum WELL Building Certification. From start to finish, certification of the CSL took about one year.

How the CSL Achieved WELL Certification

Construction of the CSL began in late 2010 and the building opened in December 2012. From the beginning, it was designed to achieve LEED Platinum and LBC certification. After learning about the WELL Building Standard at an industry conference in early 2013 and finding it complementary to the other green certifications, the CSL was registered as a pilot project in the fall of 2013 following a year of occupancy. In January 2014, documentation illustrating how the CSL met the

WELL Building Standard Categories

The following sections discuss Phipps’ implementation of the WELL Building Standard Pilot Program at the CSL. A brief summary of the features pursued and the corresponding score for each category is provided, followed by a detailed Deep Dive checklist providing more information about the CSL’s performance of each feature.



“The CSL was created to demonstrate important connections between human and ecological health, and to highlight the ways in which the built environment intersects with nature.”

Richard Piacentini, Phipps Executive Director

Air

The WELL Building Standard for Air establishes requirements to create optimal indoor air quality (IAQ) that supports the health and well-being of a building's inhabitants.

Compliance with air quality standards was particularly important because the CSL was built on a remediated brownfield site. To ensure compliance, an air flush prior to occupancy and IAQ test prior to and 10 months into occupancy were performed. Direct Source Ventilation within the CSL was achieved via the provision of dedicated ventilation, operable windows, and outdoor air quality monitoring. No smoking and purchasing policies were updated to comply with stated conditions related to smoke elimination and volatile organic compound (VOC) reduction as was Phipps' Operations and Management policy (specifically related to green cleaning protocol and limited pesticide use). Air vent placement and filtration requirements implemented met both the Healthy HVAC precondition and Combustion Free Air optimization. Interior finishes and furnishings also met strict materials restrictions to prevent unhealthy off-gassing.

The CSL incorporated 10 features (7 preconditions and 3 optimizations) to earn a score of 10 — Platinum for the Air category.

Points of Interest

- Under the Cleaning and IAQ Protocol feature, the WELL Building Standard Pilot program included a requirement that carpets must be vacuumed in four different directions once a week. Phipps has trained weekend custodial staff in implementing this requirement.
- To meet the Direct Source Ventilation feature, fresh air is brought inside the CSL. Outdoor air quality is monitored via an on-site weather station and when outdoor air is worse than inside, natural ventilation is prohibited.
- Indoor air quality isn't always the cleanest. VOC levels indoors can be up to five times higher than outside! Indoor and outdoor air quality sensors at the CSL monitor conditions to determine when outdoor air quality parameters are better than indoor and opens the building's windows to let in fresh air, while shutting off mechanical systems. Plants adept at removing pollutants are provided throughout the CSL and help clean the indoor air.

Features Pursued

PRECONDITIONS

- Air Quality Testing
- Direct Source Ventilation
 - Healthy Entrance
- VOC Reduction and Smoke Elimination
- Cleaning and IAQ Protocol
 - Humidity Control
 - Healthy HVAC

OPTIMIZATIONS

- Toxin Elimination
- Combustion Free Air
- Materials Red List

Features Not Pursued

OPTIMIZATIONS

- Advanced Filtration

Score

10/10 — PLATINUM



Did You Know?

Humans spend about 90% of each day indoors.

Air: A Deep Dive

The following table lists each feature of the Air category and details how the CSL achieved compliance for each feature.

Feature	Compliance	
Preconditions	Air Quality Testing	<ul style="list-style-type: none"> • Air flush prior to occupancy and construction protection: During construction of the CSL, all air ducts, plenums, and shafts were sealed and then vacuumed before registers, grilles, and diffusers were installed. Prior to occupancy, an air change flush (14,000 ft³ of outdoor air per sf or floor area) was performed at the CSL. This is also required for LEED certification. • IAQ test: Prior to occupancy, an indoor air quality test was performed consistent with the USEPA’s Compendium of Methods for the Determination to confirm air quality conditions met stated requirements. The following conditions were measured: formaldehyde, PM_{2.5}, PM₁₀, total volatile organic compounds (VOCs), 4-phenylcyclohexane, carbon monoxide, ozone, and nitrogen dioxide. Testing is also required to obtain LBC certification. (Note: testing is also required after 10 months of occupancy per LBC standards.)
	Direct Source Ventilation	<ul style="list-style-type: none"> • Ventilation rates: Ventilation rates were designed to comply with all requirements set in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standard 62.1.2010. Breathing air zone rates are actually 55% above those required. This is also required for LEED certification. • Dedicated ventilation: Separate dedicated ventilation was included for bathroom exhaust fans and janitorial chemical closets. During the performance audit, it was noted that no exhaust was present in the upstairs copy room. A dedicated exhaust was installed prior to final certification. • Operable windows: Construction documents illustrated and the on-site audit confirmed that each occupied space included user-operable windows. All regularly occupied spaces are located within 15 feet of operable windows to maximize quality of light and air. • Outdoor air quality: An on-site weather station measures outdoor air temperature and humidity. This information is linked to the building management system that also collects real-time air quality data from airnow.gov. An Aircuity system monitors real time indoor and outdoor air quality. This data prevents natural ventilation when outdoor air quality is poor or indoor temperature or humidity would be altered beyond occupant comfort.

Feature	Compliance
Healthy Entrance	<ul style="list-style-type: none"> • Particulate reduction:The CSL includes covered entrance doors, 10-foot long metal grilles in front of the entrance doors, and 10-foot long walk-off mats in the atrium to minimize particulate track in. • Smoke reduction: Smoking is prohibited on the Phipps campus and within Schenley Park. • Pesticide use:The Phipps Operations & Management policy specifies measures to minimize pesticide and herbicide use on the campus, including planting native plants and incorporation of an integrated pest management protocol coupled with supplemental target applications of soaps and oils.
VOC Reduction and Elimination	<ul style="list-style-type: none"> • Smoke elimination: Smoking is prohibited within any building on the Phipps campus, including the CSL. • VOC reduction: Interior architectural paints, coatings, and primers, anti-corrosive and anti-rust paints, and clear wood finishes, floor coatings, stains, sealers, and shellacs used at the CSL were low-VOC. This is also required for LEED and LBC certification.
Cleaning and IAQ Protocol	<ul style="list-style-type: none"> • Cleaning protocol:To meet this standard, the Phipps Operations and Management policy was modified to specify the use of approved cleaning products, incorporate four-part vacuuming to reduce dust and other particulates, and outline an approved cleaning schedule. • Cleaning chemicals:The Phipps Operations and Management policy lists approved cleaning products that do not contain any “Chemicals of Concern” as described by the USEPA and the European Union.
Humidity Control	<ul style="list-style-type: none"> • Relative humidity:To ensure relative humidity is maintained between 30 and 50 percent, free standing humidifiers (Essick Air 4DTS 300) were purchased for use.
Healthy HVAC	<ul style="list-style-type: none"> • Air changes:The HVAC design at the CSL was planned to bring in outside air. • CO₂ monitoring:The on-site Aircuity system monitors CO₂, among other parameters. • Vent placement: Construction documents illustrated and the on-site audit confirmed that air vents are located on the floor and outtake vents are placed on the opposite walls about a foot from the ceiling. • Filtration:The HVAC system at the CSL incorporates MERV 13 media filters.
	<ul style="list-style-type: none"> • <i>Heating and cooling:</i>The CSL uses a compressor system, rather than a hydronic system. This part was not required.

Preconditions

Feature

Compliance

Advanced Filtration

- Sterilization: UV treatment devices are built into the HVAC system at the CSL.
- *Carbon filtration: Incorporation of an activated carbon filter was not attempted at the CSL. As an optimization, advanced filtration techniques were not required nor attempted at the CSL.*

Toxin Elimination

- Formaldehyde: No interior finishes or furnishings within the CSL contain any added formaldehyde, and on-site air testing confirmed its absence. This was also required for LBC certification.
- Polyvinyl chloride: No interior finishes or furnishings within the CSL contain any polyvinyl chloride (PVC). This was also required for LBC certification.
- Polyurethane: No interior finishes or furnishings within the CSL contain any polyurethane. This was also required for LBC certification.
- Flame retardants: No interior furnishings contain any phthalates, polybrominated, or brominated flame retardants. This was also required for LBC certification.

Combustion Free Air

- There are no fireplaces, wood stoves, or gas appliances at the CSL. This was also required for LBC certification.

Materials Red List

- All interior finishes and furnishings used at the CSL comply with the LBC materials red list restrictions. This was also required for LBC certification.

Did You Know?

The materials red list is a list of chemicals and materials that are harmful to humans compiled by the International Living Future Institute as part of the Living Building Challenge. It includes materials such as asbestos, flame retardants, and PVC, as well as wood treatments containing creosote.





Water

The intention of the WELL Building Standard for Water is to deliver the healthiest and cleanest possible water for consumption through clean source water selection and filtration and to apply the most appropriate quality of water for other indoor uses.

To ensure safe drinking water and verify compliance with each feature's requirements, filter unit specifications were reviewed and an assessor performed water testing during the on-site assessment. Potable water to the CSL is provided by the Pittsburgh Water and Sewer Authority (PWSA), and this water met all specified significance criteria for suspended solids, dissolved materials, chlorine, fluoride, and water hardness.

The CSL's incorporation of all 3 Pilot preconditions earned a score of 10 — Platinum for the Water category.

Points of Interest

- All storm and sanitary water generated by the CSL is treated onsite. By incorporation of various filters and ultraviolet sanitation lamps, the water is actually cleaner than municipal water! Storm water is reused for toilet flushing.

Features Pursued

PRECONDITIONS

- Healthy Source Water Protocol
- Impurity Reduction
- Chlorine and Fluoride Reduction

Features Not Pursued

OPTIMIZATIONS

- Advanced Water Treatment
- Water Infusions

Score

10/10 — PLATINUM

Water: A Deep Dive

The following table lists each feature of the Water category and details how the CSL achieved compliance for each feature.

Preconditions	
Feature	Compliance
Healthy Source Water Protocol	<ul style="list-style-type: none"> An IWBI assessor performed water testing to confirm that potable PWSA water used at the CSL met chlorine, fluoride, and water hardness levels as well as the EPA's Drinking Water Standards.
Impurity Reduction	<ul style="list-style-type: none"> Suspended solids: An IWBI assessor performed water testing to confirm that drinking water met specified turbidity standards. Dissolved materials: An IWBI assessor performed water testing to confirm that drinking water met specified standards for dissolved minerals including aluminum, arsenic, chloride, lead, manganese, and sodium. Additionally, under-counter filter units able to reduce chlorine taste, lead, cysts, and VOCs were installed at each kitchen sink.
Chlorine and Fluoride Reduction	<ul style="list-style-type: none"> Chlorine reduction: An IWBI assessor performed water testing to confirm that water met specified chlorine standards. Additionally, under-counter filter units able to reduce chlorine taste and odor were installed at each kitchen sink. Fluoride reduction: An IWBI assessor performed water testing to confirm that water met specified fluorine standards.
Optimizations	
Feature	Compliance
Advanced Water Treatment	<ul style="list-style-type: none"> <i>Ultraviolet (UV) light: As an optimization, advanced filtration techniques, including the treatment of all drinking water with UV light to further improve water quality, were not required nor attempted at the CSL.</i> <i>Water hardness: As an optimization, advanced filtration techniques, including the measurement and limitation of calcium carbonate levels in all faucets to further improve water quality, were not required nor attempted at the CSL.</i>
Water Infusions	<ul style="list-style-type: none"> <i>As an optimization, this feature, which specified that showers in homes and hotels must infuse vitamin C, aromatherapy oils, or bath oil, was not required nor attempted at the CSL.</i>

Did You Know?

The Institute of Medicine recommends that women consume approximately 91 oz and men 125 oz of water per day. How much water have you had today?
(from The National Academy of Sciences' *Dietary Reference Intakes*)

Nourishment

The WELL Building Standard for Nourishment uses design and technology to provide and encourage healthy eating habits for building occupants.

Healthy eating habits encompass food ingredients, or what we eat, as well as cultural practices, or how we eat. Many of the requirements of the Nourishment features, including the use of approved cutting surfaces, counters, cold storage, and meat storage, were met at the on-campus Café Phipps, consistent with Health Department standards. At the CSL, microwave oven signage and informational displays are presented to keep occupants at least three feet away when in use. Dietary information, advice, and tips are displayed in kitchens and staff are offered use of an app for nutrition tracking. Internal policy revisions requiring 100% organic fruits and vegetables as well as hormone- and antibiotic-free and vegetarian fed meat and dairy at the CSL were incorporated to be consistent with the Organic Workplace Foods feature requirements.

The CSL included 7 features (4 preconditions and 3 optimizations) to earn a score of 10 — Platinum for the Nourishment category.

Points of Interest

- To comply with the Organic Workplace Foods feature, Phipps revised its food purchasing policy to require 100% organic produce and vegetarian-fed meat and dairy free of growth hormones and antibiotics for all catering within the CSL.

Left: Sign asks operators of the microwave to stand behind the red dots on the floor which are three feet away from the microwave. **Right:** Informational flyers showcasing healthy eating habits and recipes displayed on kitchen refrigerators.



Features Pursued

PRECONDITIONS

- Food Preparation Equipment – Microwave Ovens
- Food Preparation Surfaces
 - Food Habits
- Hydration Station

OPTIMIZATIONS

- Healthy Food and Storage
 - Healthy Ingredients
- Organic Workplace Foods

Features Not Pursued

OPTIMIZATIONS

- Herbarium
- Nutrition Tracking

Score

10/10 — PLATINUM

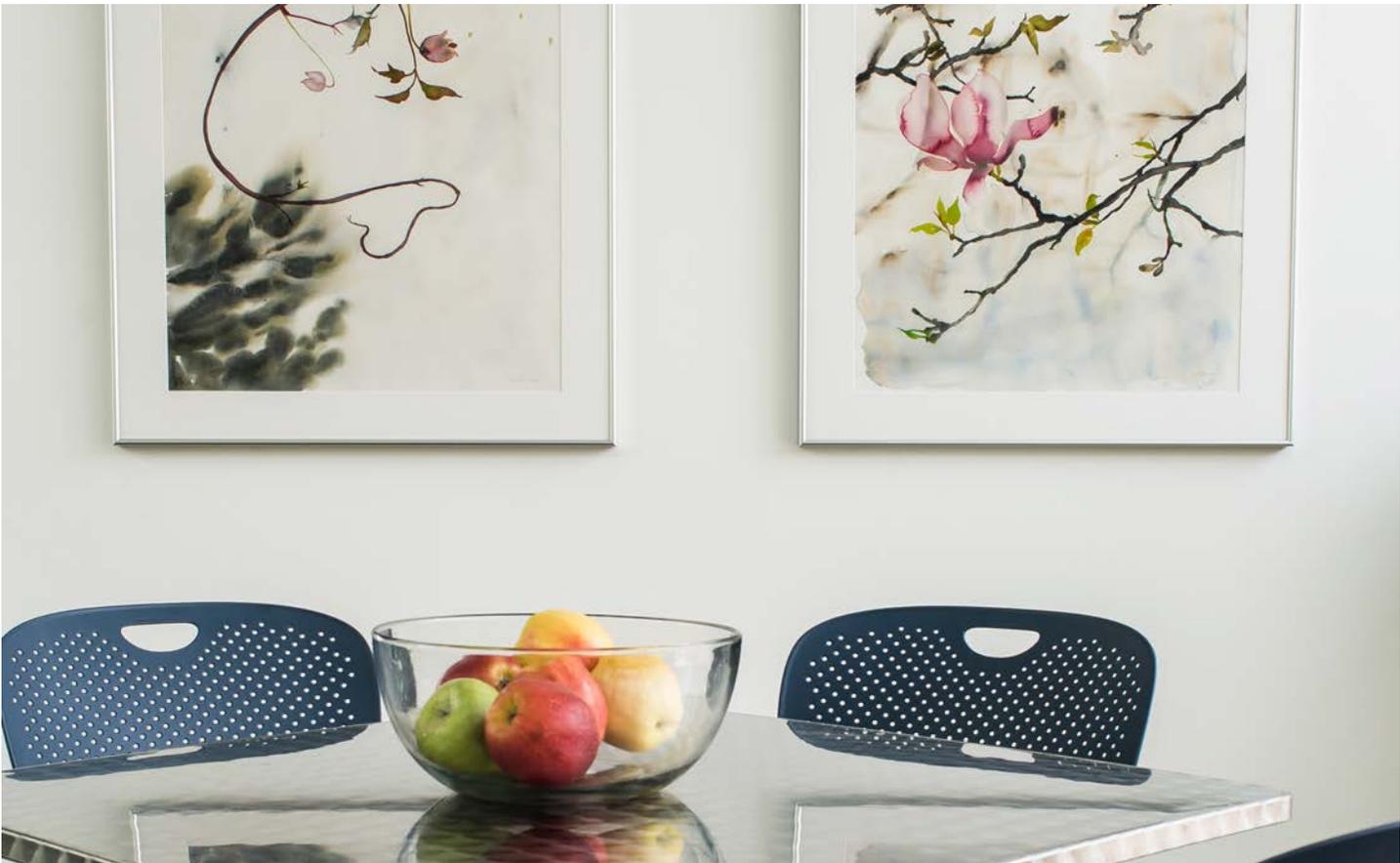
Nourishment: A Deep Dive

The following table lists each feature of the Nourishment category and details how the CSL achieved compliance for each feature.

Feature	Compliance	
Preconditions	Food Preparation Equipment	<ul style="list-style-type: none"> • Microwave ovens: To prevent potentially harmful health side-effects, signage demonstrating safe use of microwaves is in place in each kitchen within the CSL as are stickers illustrating a three-foot radius for operators to stand behind while the microwaves are in operation. • <i>Induction cooktops: As the CSL does not contain any induction cooktops, this was not required.</i> • Juicers: Juicers are provided at the on-campus café. • Blenders: Blenders are provided at the on-campus café. • <i>Steam oven: As the CSL does not contain any steam ovens, this was not required.</i> • <i>Non-toxic cooking materials: As the CSL does not provide cooking materials in employee break rooms/kitchens, this was not required.</i>
	Food Preparation Surfaces	<ul style="list-style-type: none"> • Cutting surfaces: The on-campus café contains separate non-porous, removable cutting boards without seams for vegetables, fish, and meat. • Counters: Kitchen counters in the CSL kitchens and volunteer break room are constructed from DuPont Surfaces, Corian Terra Collection, Grade Four, a single non-porous material without seams and joints to prevent reservoirs of contaminants. • Kitchen sinks: The on-campus café contains separate sinks for meat, consistent with Health Department standards.
	Food Habits	<ul style="list-style-type: none"> • Dietary information, advice, and tips that promote good eating habits are displayed on the kitchen refrigerators at the CSL.
	Hydration Station	<ul style="list-style-type: none"> • Filtered water is provided at each kitchen sink and the volunteer area at the CSL. The water meets all requirements of the Water section.

Feature	Compliance
Healthy Food and Storage	<ul style="list-style-type: none"> • Cold storage: There are two Frigidaire FPU12188LF refrigerators at the CSL, which are Energy Star rated. Professional refrigeration is also provided at the on-campus café. • Meat storage: Professional refrigeration for meat storage is provided at the on-campus café, consistent with Health Department standards.
Herbarium	<ul style="list-style-type: none"> • <i>Vitamin and supplement storage: While the CSL does not have any dedicated vitamin and supplement storage, there are cabinets in the kitchens for staff use. As an optimization, this was not required.</i> • <i>As an optimization, provision of a dedicated herbarium was not required.</i>
Healthy Ingredients	<ul style="list-style-type: none"> • Healthy ingredients: Café Phipps features local and organic foods and utilizes produce grown in on-site display gardens. The food and drinks available at the on-campus café do not contain more than 15 g of sugar per 8 oz serving; artificial colors, flavors, or sweeteners; more than 40% sugar by weight; trans fats; or more than 5% of calories from polyunsaturated fats. The food is cooked with oils that have polyunsaturated fat content below 10%. Also, while not required for certification, flavored syrup shots for coffee beverages were eliminated from the café. • Gluten free: Labeled gluten free options were added to the menu at the on-campus café.
Nutrition Tracking	<ul style="list-style-type: none"> • <i>Food habits: As an optimization, nutrition tracking was not required nor attempted at the CSL; however, through Lunch & Learn programming Phipps has offered staff and occupants the option of downloading the StayWELL Home App and/or the Calorie Counter & Diet Tracker by MyFitnessPal and shared the importance of monitoring daily nutrient intake.</i> • <i>Scale: As an optimization, the provision of a food scale was not required.</i>
Organic Workplace Foods	<ul style="list-style-type: none"> • Organic produce: Phipps revised its sustainable purchasing policy to require all fruit and vegetables at the CSL to be 100% organic. • Growth hormones: Phipps revised its sustainable purchasing policy to require growth hormone- and antibiotic-free and vegetarian fed meat and dairy at the CSL.

Optimizations



Light

The WELL Building Standard for Light provides illumination guidelines that aim to minimize disruption to the body's circadian system, enhance productivity, and provide appropriate visual acuity where needed. It also contains specialized lighting systems to promote Vitamin D synthesis, increase alertness, enhance user experience, and decrease seasonal affective disorder.

In addition to facilitating the body's circadian rhythm, proper lighting prevents eyestrain and reduces vision-related headaches. The CSL is uniquely situated on the Phipps Conservatory and Botanical Gardens campus, providing numerous opportunities for natural light exposure throughout the day. Both the conservatory and CSL building provide ample natural light, which is key to maintaining circadian rhythms and natural sleep cycles.

The CSL was designed with an "outside-in, passive first" strategy; its orientation maximizes northern and southern exposure, allowing for natural light to illuminate the indoor space. Additionally, internal surfaces, such as walls and ceilings, and external surfaces, including solar shelves, are strategically placed and designed for maximum light reflectivity (without being glare-inducing) and lighting within the CSL is divided into zones for customization and modification during various activities. Task lighting is also provided, allowing for reduced ambient lighting. Post-occupancy evaluations and a light study were performed to measure light levels and ensure compliance.

The CSL included 7 features (5 preconditions and 2 optimizations) to earn a score of 10 — Platinum for the Light category.

Features Pursued

PRECONDITIONS

- Window Performance and Design
 - Surface Design
 - Activity Based Lighting Levels
 - Color Spectrum
- Interior Sun and Glare Control

OPTIMIZATIONS

- Automated Lighting Controls
- Circadian Lighting Emulation

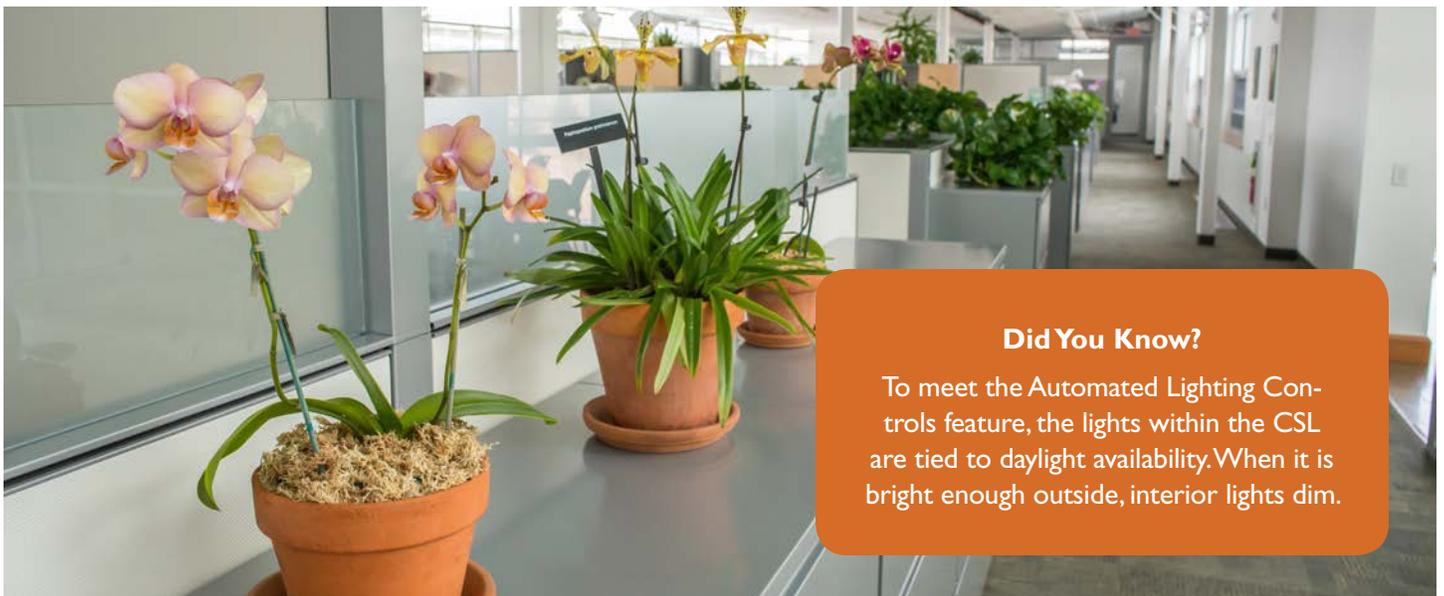
Features Not Pursued

OPTIMIZATIONS

- Light Therapy
- UV Management

Score

10/10 — PLATINUM



Did You Know?

To meet the Automated Lighting Controls feature, the lights within the CSL are tied to daylight availability. When it is bright enough outside, interior lights dim.

Light: A Deep Dive

The following table lists each feature of the Light category and details how the CSL achieved compliance for each feature.

Feature	Compliance
Window Performance and Design	<ul style="list-style-type: none"> • General guidelines for all spaces: Windows along east- and west-facing walls are limited. Windows are provided along north and south facades, with uniform and clear color transmittance and VLT of 58% and 63% for view and daylight windows, respectively. • Workspaces: 58% VLT is provided in view windows. 63% VLT is provided in daylight windows. Window to wall ratio is between 20 and 60% on external elevations. Exterior solar shelves along the southern facade block direct solar penetration. In addition, all vision glass along the southern facade has operable internal blinds to control glare. <p><i>• Residences and non-critical work spaces: As this part is required for residences, blackout shades and specified window to wall ratios were not attempted at the CSL.</i></p>
Surface Design	<ul style="list-style-type: none"> • Task-oriented spaces: Sound absorbing ceiling panels, walls, furniture system panels, and desktops have a light reflectance value of .75, .77, .70, and .59, respectively. <p><i>• Primary living space: As this part specified light reflective values for residences, this was not applicable to the CSL.</i></p> <p><i>• Bedrooms: As this part specified light reflective values for bedrooms within residences, this was not applicable to the CSL.</i></p>
Activity Based Lighting Levels	<ul style="list-style-type: none"> • General guidelines for all spaces: Ambient lighting at the CSL is dimmable and indirect. <p><i>• Bedrooms: As this part specified ambient lighting requirements for residences and hospitality, this was not applicable to the CSL.</i></p> <p><i>• Primary living spaces: As this part specified ambient lighting requirements for residences, this was not applicable to the CSL.</i></p> <ul style="list-style-type: none"> • Workspaces: A post-occupancy daylight report confirmed that ambient lighting provides at least 20 footcandles of light, LED task lighting provides at least 50 footcandles, and kitchen surfaces are illuminated with at least 50 footcandles. • Bathrooms and storage: Performance verification confirmed that ambient lighting in the bathrooms is less than 15 footcandles and task lighting at sinks provides 30 footcandles.

Preconditions

	Feature	Compliance
Preconditions	Color Spectrum	<ul style="list-style-type: none"> • <i>Bedrooms:As this part provides lighting requirements for residences and hospitality, this was not applicable to the CSL.</i> • <i>Primary living spaces:As this part provides lighting requirements for residences, this was not applicable to the CSL.</i>
		<ul style="list-style-type: none"> • Workspaces:All lighting within the CSL has a CRI of 80 or greater. • Bathrooms:All lighting within the CSL has a CRI of 80 or greater.
		<ul style="list-style-type: none"> • <i>Nightlights:As this part provides lighting requirements for residences and hospitality, this was not applicable to the CSL.</i>
	Interior Sun and Glare Control	<ul style="list-style-type: none"> • Exterior sun control:Windows at the CSL contain exterior solar shelves to block direct solar penetration during the summer months. • Interior sun control:Windows at the CSL contain interior solar shelves that direct the sun's rays and aid in reducing direct light penetration by 90 percent or more. In addition, horizontal window blinds can eliminate glare for occupants.

	Feature	Compliance
Optimizations	Automated Lighting Controls	<ul style="list-style-type: none"> • <i>Residential:As this optimization provides specifications for residences, this was not applicable to the CSL.</i>
		<ul style="list-style-type: none"> • Commercial: Interior lighting is zoned and controlled separately to provide flexibility.A daylight harvesting light system also ties interior lights to daylight availability, engages high-performance, energy-efficient T-5 fluorescent lighting, and dims interior lights as appropriate. Occupancy sensors automatically turn off lights when a room is not in use after eight minutes.
	Light Therapy	<ul style="list-style-type: none"> • Due to its unique location on the Phipps Conservatory and Botanical Gardens campus, occupants at the CSL have access to the conservatory and outdoor gardens, where abundant natural light is available, during all seasons.
	Circadian Lighting Emulation	<ul style="list-style-type: none"> • Adaptability: Due to its unique location on the Phipps Conservatory and Botanical Gardens campus, occupants at the CSL have access to the conservatory and outdoor gardens, where abundant natural light in excess of 100 footcandles is available most of the day, during all seasons. Employees are encouraged to take breaks and experience nature and natural daylight in the gardens and conservatory, which can help link people to the natural circadian lighting cycles.

Feature

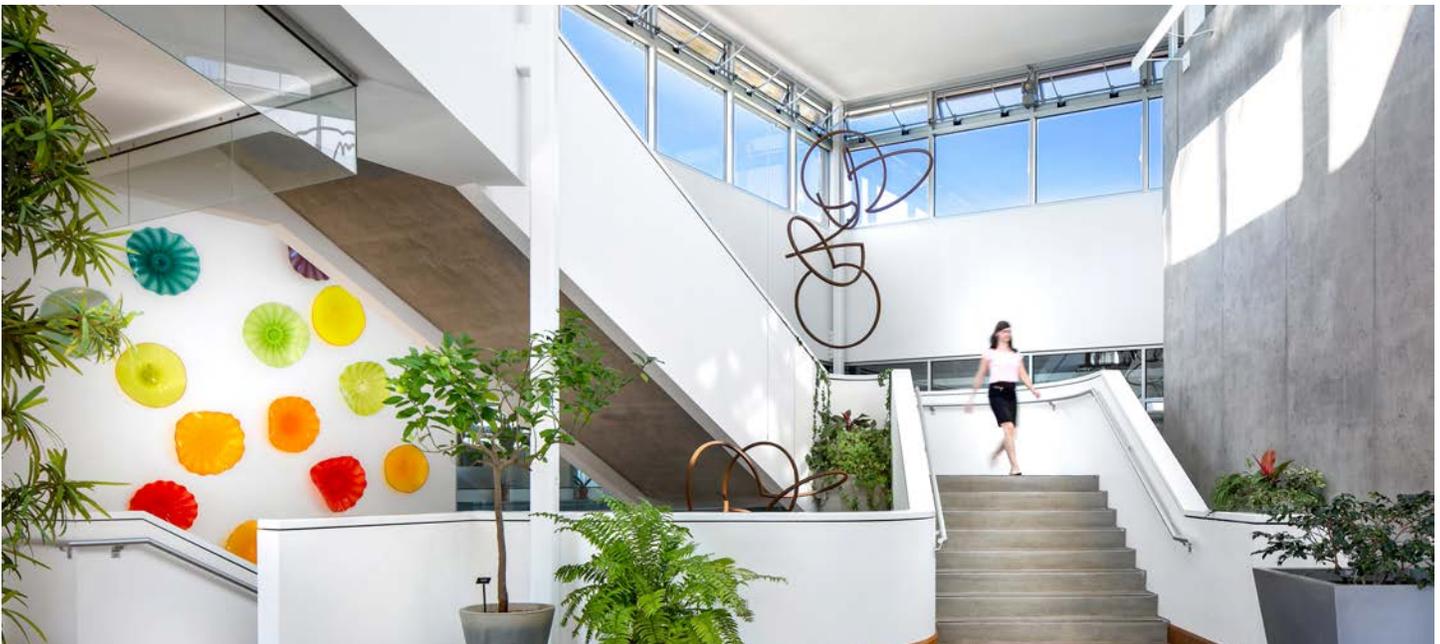
Compliance

Circadian Lighting Emulation
(continued)

- **Daily timing:** Due to its unique location on the Phipps Conservatory and Botanical Gardens campus, occupants at the CSL have access to the conservatory and outdoor gardens, where abundant natural light in excess of 100 footcandles is available most of the day, during all seasons. Employees are encouraged to take breaks and experience nature and natural daylight in the gardens and conservatory, which can help link people to the natural circadian lighting cycles.

UV Management

- *Software interface:* As an optimization, provision of a tool that tracks user UV exposure and Vitamin D levels, monitors outdoor lighting conditions, and recommends sun exposure duration and timing was not required nor attempted at the CSL.
- *UVB lamp:* As an optimization, provision of a device that produces UVB for the purpose of Vitamin D production in the skin was not required nor attempted at the CSL.



Fitness

The WELL Building Standard for Fitness aims to provide the physical features and components to support an active, healthy lifestyle that allows for the seamless integration of exercise and fitness into everyday life.

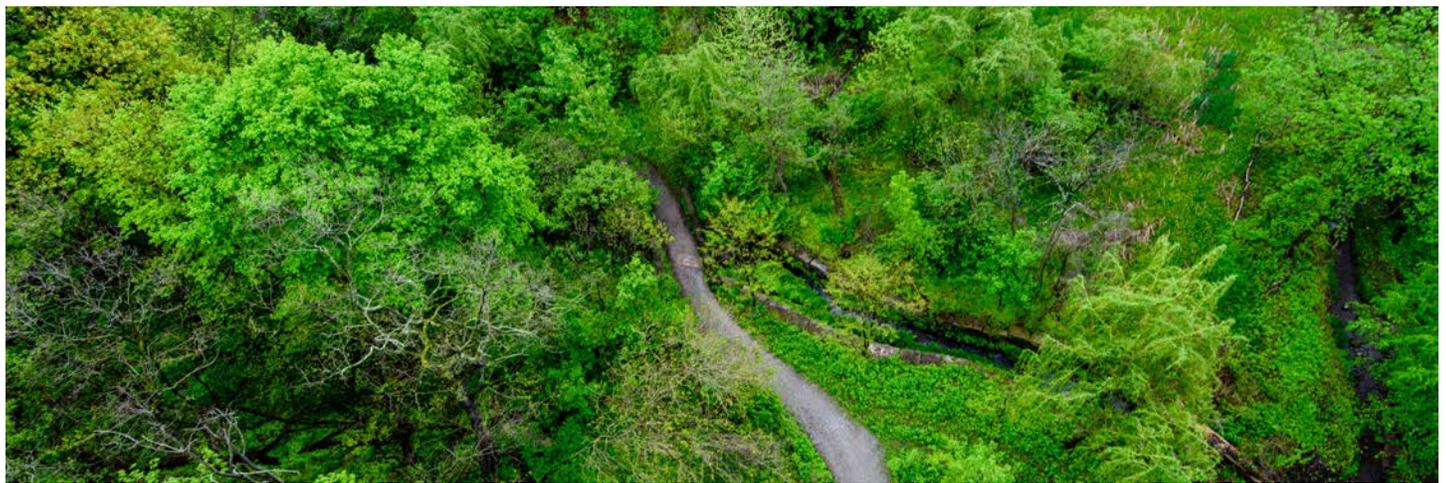
The Centers for Disease Control define physical fitness as “the ability to carry out daily tasks with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure-time pursuits and respond to emergencies.”² The CSL incorporated a number of features to promote physical activity during the workday for building occupants and visitors. The design of the building promotes stair usage, and the green roof includes a path for walking. Bike storage is provided at numerous locations on site. Showers are provided in the upper campus in the Production Greenhouses and pedometers are provided for all staff. Ample trails are accessible throughout adjacent Schenley Park.

The lowest ranked of all categories, Fitness features scored low due to delayed provision of fitness equipment (which will be included in the forthcoming Exhibit Staging Center project on campus).

The CSL included three features (1 precondition and 3 optimizations) to earn a score of 7 — Gold for the Fitness category.

Points of Interest

- The American College of Sports Medicine, among others, recommends that all healthy adults engage in at least 30 minutes of moderate-intensity aerobic activity five days per week and muscle-strengthening activities at least two days per week.



² Source: <https://www.cdc.gov/physicalactivity/basics/glossary/>

Features Pursued
PRECONDITION
• Interior Exercise Space
OPTIMIZATIONS
• Access to Fitness Infrastructure
• Exercise Equipment
• Professional Fitness Program
Features Not Pursued
OPTIMIZATIONS
• Forgiving Floors
Score
7/10 — GOLD

- The Exercise Equipment feature was not pursued under the Pilot program due to space constraints at the CSL. Cardiovascular and resistance equipment will be provided within a dedicated fitness room at the adjacent Exhibit Staging Center. A yoga room and a meditation space will also be included, as will expanded shower facilities.

Fitness: A Deep Dive

The following table lists each feature of the Fitness category and details how the CSL achieved compliance for each feature.

	Feature	Compliance
Precondition	Interior Exercise Space	<ul style="list-style-type: none"> Exercise space is not provided at the CSL; however, dedicated interior exercise space will be provided at the forthcoming on-campus Exhibit Staging Center.
Optimizations	Access to Fitness Infrastructure	<ul style="list-style-type: none"> Showers: Private showers, available for all staff, are located on the upper campus in the Production Greenhouses. Bike storage: Bike storage is provided at multiple locations throughout the Phipps campus.
	Forgiving Floors	<ul style="list-style-type: none"> <i>Flooring standards: As an optimization, the provision of floors constructed with a floating surface and cork or natural rubber underlay was not required nor attempted at the CSL. Phipps pursued WELL Building Certification after construction, when modification of the floors would have proven an extensive retrofit.</i> <i>Slip-resistant floor: As an optimization, provision of slip-resistant floors was not required nor attempted at the CSL. Phipps pursued WELL Building Certification after construction, when modification of the floors would have proven an extensive retrofit.</i>
	Exercise Equipment	<ul style="list-style-type: none"> Cardiovascular equipment: Exercise space is not provided at the CSL; however, dedicated interior exercise space with cardiovascular equipment will be provided at the forthcoming on-campus Exhibit Staging Center. Resistance equipment: Exercise space is not provided at the CSL; however, dedicated interior exercise space with resistance equipment will be provided at the forthcoming on-campus Exhibit Staging Center.
	Professional Fitness Program	<ul style="list-style-type: none"> <i>Education: As an optimization, electronic-based exercise methods available via instructional videos were not required nor attempted at the CSL.</i> <i>Instructional program: As an optimization, in-person training programs were not required nor attempted at the CSL.</i> <i>Biotelemetry: As an optimization, biotelemetric interfaces connected to each user's doctor was not required nor attempted at the CSL.</i> <ul style="list-style-type: none"> Smart equipment/gear: Omcron HF-320 Trix Axis pedometers are available for occupant use.

Comfort

The WELL Building Standard for Comfort is designed to create the most distraction-free, productive, soothing, and comfortable indoor environment that is practically possible.

Acoustic, ergonomic, olfactory, and thermal factors all contribute to indoor comfort. To provide a comfortable environment at the CSL, humidifiers, personal fans, standing desk top height adjustment stands, and adjustable chairs are provided for building occupants to address Thermal Comfort and Ergonomics.

Biophilic Sound is incorporated via a sound art installation in the atrium. The CSL is ADA-compliant and accessible for all occupants and visitors. Acoustic testing and electromagnetic field (EMF) monitoring occurred during the on-site assessment. A post-occupancy evaluation and a comfort survey were also performed to analyze occupant thermal comfort.

The CSL included 7 features (3 preconditions and 4 optimizations) to earn a score of 8 — Gold for the Comfort category.

Points of Interest

- Comfort is highly subjective. Recognizing this, a number of comfort-related amenities under the Thermal Comfort feature were incorporated into the CSL to maximize individual modifications, including temperature zones, user controls, operable windows, and personal fans at each desk.
- The CSL has a temperature setpoint between 70 and 75 degrees F. This range maximizes the number of hours of natural ventilation.



Features Pursued

PRECONDITIONS

- Thermal Comfort
- Universal Design
- Electromagnetic Field Protection

OPTIMIZATIONS

- Ergonomics
- Healthy Surfaces
- Thermal Optimization
- Biophilic Sound

Features Not Pursued

OPTIMIZATION

- Spa

Score

8/10 — GOLD

Left: Personal desk fans allow occupants to regulate air movement and comfort individually. **Right:** Adjustable desk height devices from Varidesk and iCraze that can adjust desk heights up to 46” are offered to CSL occupants.



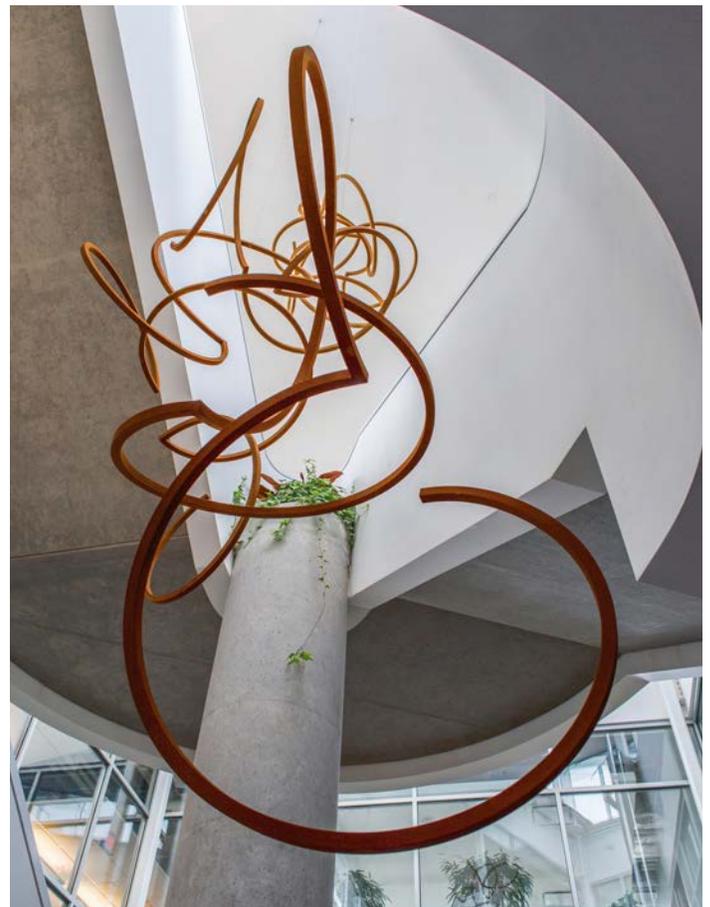


The BETA Project

The BETA (Biophilia Enhanced Through Art) Project is a multi-sensory biophilic art program that uses art to create spaces that remind us of nature's beauty and demonstrate and celebrate the interconnectedness of human and natural processes. The project includes art that features beauty, cycles and seasons, interactive, intrinsic connection, mindfulness, rethinking possible, scale, sensory rich, subtlety, and symbolic geometry patterns. Some of the installations within the CSL include:

- Locally-recorded nature sounds that vary with the seasons, weather, and time of day
- Textured wood tables, bench, and shelves
- Steel sculptures, including a ceiling mounted steel sculpture that appears both heavy and weightless
- Nature-inspired paintings and glass pieces
- Fairchild Challenge student artwork
- Fossil replicas
- Nature photography
- A bronze windbell

For more information about the BETA Project, visit phipps.conservatory.org/BETA



Comfort: A Deep Dive

The following table lists each feature of the Comfort category and details how the CSL achieved compliance for each feature.

Feature	Compliance
Thermal Comfort	<ul style="list-style-type: none"> • Operational range:To ensure relative humidity is maintained between 30 and 50 percent, free standing humidifiers (Essick Air 4DTS 300) were purchased for use. • Air movement: Personal desk fans are provided for occupants to increase local air movement. • Window adjusted temperature: Many of the windows at the CSL are able to be manually opened to modify interior temperature and provide fresh air when outdoor air quality conditions allow.
Universal Design	<ul style="list-style-type: none"> • The CSL was designed to be ADA compliant.
EMF Protection	<ul style="list-style-type: none"> • Performance:An EMF monitor was employed during the on-site audit conducted by IWBI to ensure all regularly occupied spaces have magnetic field levels below 1 mG. <div data-bbox="618 1121 1523 1264" style="background-color: #d3d3d3; padding: 5px;"> <ul style="list-style-type: none"> • <i>Safe sleep:As this part applies to residences, the placement of electrical appliances was not applicable to the CSL.</i> </div> <ul style="list-style-type: none"> • Electrical supply:An EMF monitor was employed during the on-site audit conducted by IWBI to ensure the CSL was located at least 300 feet from any power lines carrying electricity above 300 kV.
Sleep Protection	<ul style="list-style-type: none"> • <i>Aromatherapy:As an optimization, the use of aromatherapy in residences and hospitality was not required nor attempted at the CSL.</i> • <i>Nightlights:As an optimization, the use of nightlights in residences and hospitality was not required nor attempted at the CSL.</i> • <i>Bedside reading lamps:As an optimization, the provision of bedside reading lamps in residences and hospitality was not required nor attempted at the CSL.</i> • <i>Biophilic sound:As an optimization, the provision of bedside devices able to produce background noise in residences and hospitality was not required nor attempted at the CSL.</i>

Optimizations	Feature	Compliance
	Ergonomics	<ul style="list-style-type: none"> • Workstations: Workstations at the CSL incorporate standing desks, wireless mice and keyboards, and adjustable chairs as requested by users to provide flexibility in equipment placement.
	Spa	<ul style="list-style-type: none"> • <i>Kitchen:</i> As an optimization, kitchen workspace requirements were not applicable to the CSL. • <i>Steam shower:</i> As an optimization, provision of a steam shower was not required nor attempted at the CSL. • <i>Whirlpool bath:</i> As an optimization, provision of a whirlpool bath was not required nor attempted at the CSL. • <i>Sauna:</i> As an optimization, provision of a sauna was not required nor attempted at the CSL.
	Healthy Surfaces	<ul style="list-style-type: none"> • Surface design: Bathroom counter surfaces at the CSL are non-porous and seamless for ease of cleaning. • Surface material: Carpet tiles at the CSL are removable for ease of cleaning and/or replacement.
	Thermal Optimization	<ul style="list-style-type: none"> • Surface treatment: The IWBI recommended using WELL Shield, a self-cleaning photocatalytic coating, in the common areas of the building. This recommendation was not required, however, and was not implemented at the CSL. • Zoning: The HVAC system in the CSL is divided into separate zones that have full independent control. • User control: The HVAC system in the CSL is divided into separate zones that have full independent control of timing, intensity, and duration. • Operable windows: Many of the windows at the CSL are able to be manually opened to modify interior temperature when outdoor air quality conditions allow. • Fans: Personal desk fans are provided for occupants to increase local air movement.
	Biophilic Sound	<ul style="list-style-type: none"> • As part of the BETA Project (Biophilia Enhanced Through Art), biophilic sound is provided in the atrium of the CSL.

Mind

The WELL Building Standard for Mind aims to implement design, technology, and treatment strategies in order to provide a physical environment in which one's health, both cognitive and emotional, are optimized.

Recognizing that physical and mental health are connected, Phipps provides a comprehensive wellness program and a staffed Wellness Concierge role. An extensive resource library is available for staff via the Intranet. Biophilic design elements are incorporated throughout the CSL. The Water Feature requirement was satisfied by the on-site lagoon used for stormwater management. A dashboard provides real-time and historic information about electricity consumption, temperature, humidity, and CO₂ levels to occupants and visitors.

The CSL included 7 features (1 precondition and 6 optimizations) to earn a score of 9 — Platinum for the Mind category.

Points of Interest

- Consistent with the Beauty and Design feature, biophilic design principles are incorporated throughout the CSL, including the use of light, nature-inspired artwork, tall ceiling heights, and expansive views.



Features Pursued

PRECONDITIONS

- Wellness Literacy

OPTIMIZATIONS

- Beauty and Design
- Environmental Display
 - Water Feature
- Healthy Product Transparency
 - Wellness Concierge
 - Knowledge Transfer

Features Not Pursued

OPTIMIZATIONS

- Relaxation Support
- Altruistic Health

Score

9/10 — PLATINUM

Did You Know?

Chromotherapy is an alternative medicine that uses colors to balance energy within the body. The colors correspond to ayurvedic chakras, or energy centers, that are associated with specific bodily systems. Chromotherapy is sometimes referred to as color therapy, colorology, or chromatherapy.

Mind: A Deep Dive

The following table lists each feature of the Mind category and details how the CSL achieved compliance for each feature.

	Feature	Compliance
Preconditions	Wellness Literacy	<ul style="list-style-type: none"> This guide describes the wellness features of the CSL. In addition, wellness resources and articles are available to building occupants via the internal Intranet.
	Feature	Compliance
Optimizations	Beauty and Design	<ul style="list-style-type: none"> Light and beauty: The CSL interior incorporates natural lighting throughout. Artwork: As part of the BETA Project, various installations are present on every floor within the CSL. Ceiling heights: Ceiling heights within the CSL range from 9' to 10'8". Views: Each occupied space within the CSL has window views to the outdoors.
	Environmental Display	<ul style="list-style-type: none"> Environment display: An interactive, electronic dashboard on the third floor of the CSL displays real time and historical electricity consumption, temperature, and humidity levels in the building. Light levels: A light study at the CSL was performed post occupancy to measure light levels. Air quality: The CSL contains an Aircuity system that determines indoor air quality by measuring temperature, humidity, and concentrations of CO₂, total VOCs, CO, and PM_{2.5}. The results are accessible by Facilities staff for any interested party. Information display: An interactive, electronic dashboard on the third floor of the CSL displays real time and historical electricity consumption, temperature, and humidity levels in the building. This data provides building operating profiles and trends to monitor ongoing energy efficiency.

Did You Know?

A healthy product declaration provides transparency by identifying the source and contents of building materials and products. Two acceptable reporting protocols are DECLARE and Health Product Declaration.

Feature

Compliance

Water Feature

- A lagoon for stormwater management is located immediately adjacent to the CSL. The lagoon incorporates a decorative fountain that stimulates moving water.

Relaxation Support

- *Bio-feedback:* As an optimization, the use of biofeedback devices was not required nor attempted at the CSL.
- *Aromatherapy:* As an optimization, the use of aromatherapy was not required nor attempted at the CSL.
- *Aromatherapy garden:* As an optimization, an aromatherapy garden was not required nor attempted at the CSL; however, the native plants as part of the green roof of the building can be aromatic.
- *Chromotherapy:* As an optimization, the use of chromotherapy was not required nor attempted at the CSL.

Healthy Product Transparency

- **Product declaration:** All interior finishes and furnishings within the CSL have a healthy product declaration. This is also required for LBC certification.
- **Accessible information:** Product declaration information and material safety data sheets for interior finishes and furnishings are available via electronic project files for occupant review. This is also required for LBC certification.

Altruistic Health

- *Community service:* As an optimization, the requirement for community service was not required nor attempted at the CSL.

Wellness Concierge

- Phipps includes a comprehensive wellness program and a staffed Wellness Concierge role. The Wellness Concierge is empowered to make connections with qualified personnel to provide specific wellness services to building occupants, including nutrition counseling, philanthropy, and meditation instructors. The Wellness Concierge also oversees programming addressing the benefits of green home cleaning and neurofeedback to stimulate brain activity.

Knowledge Transfer

- Post-occupancy surveys including user satisfaction and thermal comfort are performed quarterly.



GREEN BUILDING TOOLKIT SERIES

for more information, visit
phipps.conservatory.org/CSL



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