



LAKEHOUSE

The Basics of WELL

How the Healthy Built Environment Comes Alive

AN OPERATIONAL OUTLINE
OF WELL BUILDING STANDARD
CONCEPTS AND FEATURES



LAKEHOUSE

The WELL Building Standard is a wellness standard for buildings to promote the concept of occupant health and well-being in a healthy built environment, in both infrastructural and operational capacity. This interdisciplinary best practice converges at the intersection of health science, business science, and building science. By placing health and wellness at the center of design and programming, homes, offices, schools, and the like are being transformed. As a pioneer building in Colorado, Lakehouse, and its Gold Certification under WELL, displays the important interaction between residents, their health, and the built environment.

Indoor environments impact how we feel and perform. Through infrastructure standards (IWBI, LEED) and health programming, the development of spaces that enhance resident well-being and quality of life shine in comparison. With the increase of lifestyle-oriented and preventative approaches to individual and community health, it is important to understand how the facets of our environment interact with personal, genetic, and behavioral factors. The built environment not only shapes our physical health, but our everyday behaviors as well.

It is helpful to know that the basis for the WELL Building Standard is supported through existing research and literature in environmental health, behavioral factors, health outcomes, and demographic risk factors. In addition, leading practices in building design and management, and up-to-date standards and guidelines set by governmental and professional organizations are strong guiding principles. The International Well Building Institute was established by Delos in 2013; and frames itself to be a “corporation balancing public benefit with profitability”. The goal is to “harness the power of private capital for greater good with 51% of net profits received from WELL Certification fees going towards charitable contribution and impact investment focused on health, wellness, and the built environment” (IWBI).

WELL Building Standard Concepts, Features, and Intent

There are seven concepts in the WELL Building Standard v1

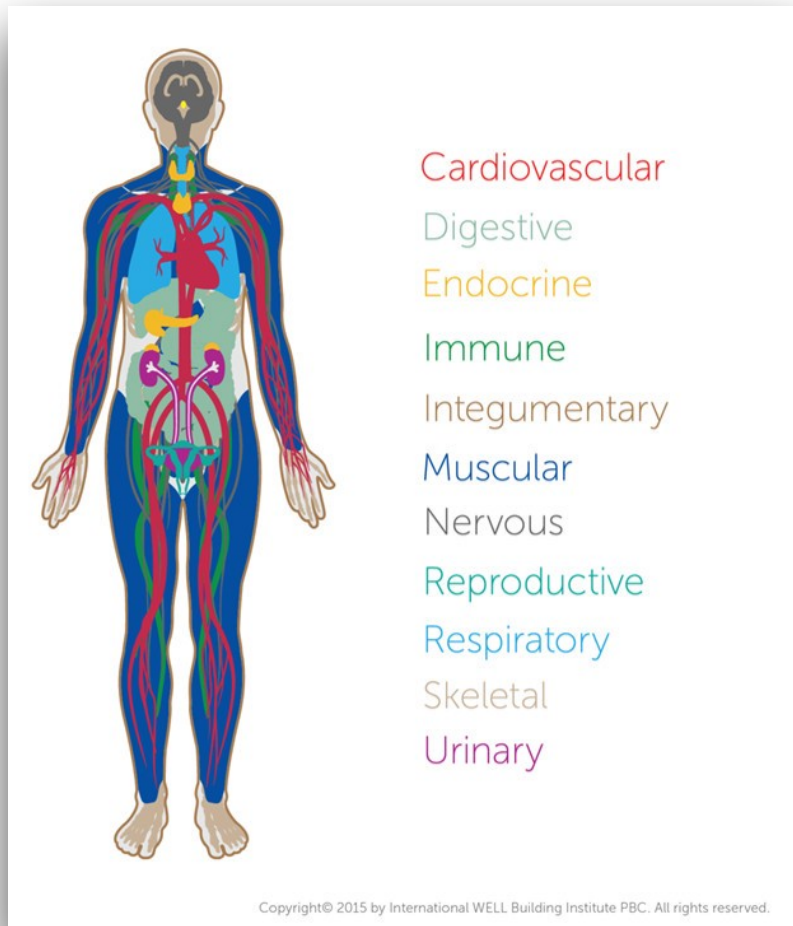
Air, Water, Nourishment, Light, Fitness, Comfort, Mind

Within these concepts are 102 features; each feature addresses specific aspects of resident health, comfort, and knowledge. Within each feature there are one or more requirements that dictate metrics and perimeters that must be met for building certification. For Lakehouse to have received credit for any feature, all of the applicable parts outlined were to be satisfied.

WELL features = Preconditions, which are the foundation for wellness in the built environment. In order to receive Certification all preconditions must be achieved. Optimizations are features pursued over and above what the basic level of achievement requires. Lakehouse was awarded the Gold Certification which means 40% of applicable optimizations were achieved in addition to meeting all preconditions. These features include additional strategies, protocols, technologies, and designs that enhance the building above and beyond the standard preconditions.

STANDARD VERSION	LEVEL OF ACHIEVEMENT	PRECONDITIONS THAT MUST BE ACHIEVED	OPTIMIZATIONS THAT MUST BE ACHIEVED
WELL Building Standard®	Core and Shell Compliance	All applicable	One Optimization from each concept
	Silver Certification	All applicable	None
	Gold Certification	All applicable	40% of applicable
	Platinum Certification	All applicable	80% of applicable
WELL Pilot Standards	Silver Certification	All applicable	20% of applicable
	Gold Certification	All applicable	40% of applicable
	Platinum Certification	All applicable	80% of applicable

Each feature is connected to an anatomical body system, emphasizing how each feature plays a vital role in the body's optimal functioning and holistic health strategy. Features are intended to improve health through the support of existing government and/or professional organization standards. In addition, some features create intention for individuals to change behavior through education, culture, and informative support with respect to initial and ongoing positive lifestyle choices.



AIR



Promoting clean air throughout the building while reducing the sources of indoor air pollution supports the health and well-being of all resident occupants within Lakehouse. By adhering to a variety of standards outlined in ten precondition-based features and a host of optimizations, air within the building is of optimal quality per the requirements set for WELL

Certification. A person breathes an average of 15,000+ liters of air each day, so the importance of that air being high-quality is great. Poor air quality is quite concerning. The air we breathe has significant impact on both short- and long-term health. Sick building syndrome is prevalent in the U.S. with the definition being a common set of symptoms, such as headaches, fatigue, eye irritation, and breathing difficulties, all believed to be caused by the indoor pollutants and poor building environment in which one works or lives. Inflammation from air pollution over time has a lasting impact on not only the respiratory system, but the entire body. Heart disease, stroke, acute respiratory infections, and chronic pulmonary disease are just a few of the maladies to be concerned with.

The contaminants that produce such poor indoor air pollution include carbon dioxide, smoke, dust, mold, bacteria and biological contaminants. Temperature and humidity are also important factors that impact indoor pollution. Bacterial and fungal growth are prevalent when humidity levels are greater than 60%; natural habitats for such microbial growth are often created by standing water in condensate pans, lines, and outside air intakes. It is recommended to regularly inspect air ventilation and filtration systems to reduce harm. By understanding and following the requirements of the WELL Building Standard, Lakehouse mitigates and thus establishes healthy indoor air quality for everyone.

Proper ventilation provides clean, fresh air and removes old, stale air from building spaces. The primary purpose of ventilation is to control the indoor air quality by diluting the polluted indoor with less contaminated outside fresh air. Natural and mechanical ventilation are a means to achieving these optimal quality measurements. At Lakehouse, not only does the constant ventilation and filtration from the air handling units reduce the contaminants that contribute to air quality issues, standards for the air quality are carefully assessed on a regular basis, limiting the levels of indoor air pollutants. Consistently adhering to the IAQ standards and addressing levels of volatile organic compounds (VOCs) in the air is one aspect of regulation. A building air flush was completed in its entirety prior to resident occupancy. HVAC system testing and balancing takes place so the equipment runs at peak efficiency. In addition to meeting the required ventilation checks, a yearly resident opt-in for unit FCU cleaning is available to decrease microbe build up.

Completing WELL feature requirements associated with appropriate VOC reduction tactics by choosing operational products, materials, and cleaning supplies that are recommended per standard guidelines and sufficiently off-gassing furniture and equipment prior to occupant move-in, prove the development and management of Lakehouse keeps the resident's well-being top of mind. The healthy entrance vestibule feature with grates and grills, in addition to walk-off mats, and elevator grates, are strategically placed to capture and reduce the amount of unhealthy contaminants tracked into the building. Operable windows in each unit and patio/balcony space for fresh air year-round allows for greater access to the outdoors. Common space Nanawalls are also part of the design for indoor/outdoor fresh air living. The smoking ban, building moisture management, and adhering to recommended cleaning procedures are additional factors that play into the critical air quality requirements for Lakehouse resident health and safety.

WATER



The WELL Standard intent for Water is to promote safe and clean water through filtration techniques and testing so that optimal quality water is disseminated throughout the building. WELL requires a broad initial assessment and evaluates the building's water source. Lakehouse passed all preconditions, in addition to adding filtration systems to meet all ongoing thresholds. Lakehouse benefits from the high standards Denver Water implements. Data shows that the quality of water throughout the city of Denver stands amongst the top in the nation. Thus, making your natural source of drinking water, regardless of filtration, of clean and nourishing quality.

At the basis of this concept is fundamental quality testing. Turbidity and total coliforms serve as the indicators of any harmful contaminants. Turbidity of water is the cloudiness or haziness of a fluid; the USGS states it as "a measure of the degree to which water loses its transparency to the presence of suspended particulates". The water at Lakehouse is crystal clear and passes the high standard of .3 NTU. The total coliforms measurement is to prevent any presence of disease-causing pathogens in the water system. The WELL standard states there shall be no total coliforms present or detected in the samplings. The Water features to be met under the WELL Standard also set maximum safety limits for inorganic, organic, and agricultural contaminants. Localized testing measures, along with the addition of carbon filters, allow for a higher level of prevention for resident health and safety. Responsible management of fertilizer usage, with all organic product used by Agriburbia only when needed in the urban farm, also helps limit any contaminants if within reach of water sources (water runoff). Implementing and maintaining water filtering systems and requiring accessibility to high quality water throughout the building assists in promoting proper hydration to all residents. The Elkay EZH2O systems throughout Lakehouse, with routine maintenance and filter changes, encourages water consumption and reduces the need for plastic bottle usage.

As more than two-thirds of the human body consists of water, it is of importance to provide and promote high-quality water consumption for the regulation of body temperature, reduction of muscle cramps and headaches, and to assist in the health of your central nervous system. Water supports your urinary system as it is the medium for transporting oxygen, nutrients, and waste throughout your body. While living in a drier climate, like Colorado, proper hydration is also key for avoiding dry skin and keeping the entire integumentary body system in good function.

NOURISHMENT



The main intent required for Nourishment throughout Lakehouse is to provide available, fresh, and wholesome foods while limiting unhealthy ingredients. All to improve eating habits and the culture around food. Why? Nutrition plays an integral part in your optimal health and well-being. Food impacts not only your physical health in weight management, disease prevention, and the functionality of body systems, but food also has an effect on your mental and emotional health. Integrative nutrition efforts and education are a large part of the Nourishment concept at Lakehouse.

As studies show, your dietary choices have both short and long-term effects. At Lakehouse we want to help reduce your risk of diabetes, metabolic disease, and obesity, all of which attribute to both acute viral infection and additional forms of chronic disease. Allow for a well-rounded, high quality, whole foods diet. Begin by crowding out your intake of sugar-sweetened beverages and high-fat, high-sugar processed foods with very low nutritional value and add fresh, simple, nourishing ingredients (from your farm!) to your daily meals. Talk with fellow residents or your Wellness Concierge about making informed dietary choices. The Lakehouse Urban Farm provides you with sustainably farmed, fresh, nutrient-dense foods. Be intentional with the true farm to table experience in your backyard. Join the gardening group with our Agriburbia farmer to get your hands in the dirt and learn about the conscious process of growing your source of food. Choose to cook and share amongst friends in the communal dining space to enhance the mindful eating process.

At Lakehouse, we follow the preconditions and optimizations in areas such as, fruit and vegetable consumption, serving sizes, hand washing, responsible food production and food storage, and mindful eating. We provide general WELL nourishment and nutritional messaging as part of the behavior change and operational cue promotion. We also promote the reduction or restriction of processed foods or artificial ingredients in the common spaces for anytime access; if such products were to be provided nutritional labeling is required for your reference (e.g., sweeteners and coffee creamers). The smallest changes to your daily routine create improved energy, physical strength, positive mood, and balanced cognitive thought. Lakehouse can guide you in making those tiny habits stick.

LIGHT



The standard for this concept provides guidelines around illumination that minimizes disruption in regards to circadian health. The goal is to enhance productivity and acute sight, and support restful sleep. All light, not just sunlight, contributes to the human body's circadian system. The body requires periods of both brightness and darkness. Physiological processes in your daily life depend on your body's clock to be in proper function - alertness, digestion, hormone regulation, immunity, and deep sleep cycles.

Chronic sleep disorders, general sleep deprivation and insomnia, and high stress levels can cause an increase in morbidities, such as hypertension, stroke, heart attack, depression, and overweight or obesity. Additional risks can include short- and long-term memory issues, mood fluctuation, weakened immune response, reduced muscle strength and poor balance. For these reasons, it is important to stay in tune with your body, understand your personal needs around the 24-hour circadian rhythm in your life and learn how light influences you in non-visual ways.

When possible, rise with the sun and unwind as the sun sets. Refrain from eating heavy meals after dark. Prepare your eyes for sleep by wearing blue-light shielding lenses or shutting down electronics two hours before bedtime. Reduce your caffeine and alcohol intake. Use the lighting design of both direct task lighting with diffused background lighting when feasible.

At Lakehouse, it is helpful to use the natural light as a personal cue throughout the day with the floor to ceiling windows throughout the building. The glass was carefully selected with the VLT (visual light transmission) at close to 60. Meaning, the window provides enough light to feel bright and colorful, but has enough shading so the solar glare does not hurt the eyes. The transparency level for the window glass is close to 11 which means it will not reflect much light nor look like a mirrored building from the outside. The option for darkness can be applied in-unit and in places throughout the building with the automated shading and dimming controls to effectively block the sunlight glare; both of which are energy saving as well. These few points captured from a more lengthy description showcase an abundance of optimization features that are in place beyond the WELL Standard precondition requirements for Lakehouse resident health and comfort.

FITNESS



By integrating physical activity into everyday life with the opportunities and support for an active lifestyle, Lakehouse residents can learn and grow in their idea of 'fitness'. Outdoor activities, community walks, tennis, kayaking, and biking are just a few ways to reduce sedentary behaviors. In today's society with modern transportation, sedentary desk jobs, working from home lifestyles, and lack of walkable neighborhood paths, the concern for physical inactivity is a large threat to public health. It is of the utmost importance individuals build their cardiorespiratory and muscle-strengthening exercise base. Make movement enjoyable by trying out the different options that are accessible to you at Lakehouse.

Fitness and general movement on a regular basis helps to prevent heart disease, type 2 diabetes, obesity, metabolic syndrome, and the like. One key factor that impacts physical activity is the built environment - stair accessibility and stair use promotion, walkable paths and bike routes, bike storage, community engagement with movement as its core, exterior design, and a lap-pool all provide opportunity to reduce inactivity. By promoting strategies, education and structured programs, both in the interior fitness lab with provided state-of-the-art equipment and outdoor fitness opportunities that facilitate regular resident movement, Lakehouse accomplishes the host of preconditions and optimizations required under the Fitness concept.

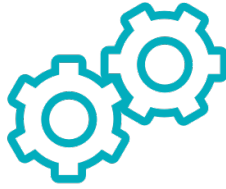
COMFORT



A healthy building design that establishes and creates space for less distraction and more productive and comfortable environments around the basis of noise, musculoskeletal and nervous system ergonomics, access for those with limited mobility, and thermal comfort each play a role in your everyday comfort.

By reducing common sources of disruption and irritation through a number of strategies, resident health and happiness can increase. Ensuring all individuals have access to building facilities in a navigable nature, Lakehouse adheres to the American Disabilities Act (ADA) design regulations. Promoting ergonomically comfortable furniture for sitting, minimizing odor within all common spaces, and balancing the thermal levels for an appropriate core body temperature are some of the best practices used to satisfy most resident comfort needs. The infrastructure was built to prevent excessive exterior noise from penetrating into the building. The exterior noise intrusion and internally generated noise (from electronics, HVAC systems, mechanical equipment, lower reverberation time, and sound reducing surfaces) is monitored so as to reduce the general amount of distraction and acoustic discomfort. Careful detailing and high quality construction material and product was all part of the purposeful plan to assist in the management of the environmental condition within Lakehouse. Mitigating physical and mental stress by achieving preconditions and optimizations associated with the Comfort concept in forms such as, energy-saving individual thermal devices, thermal gradients throughout the building, sound reducing surfaces, and tactical architectural design to minimize acoustic and privacy interruption are each, and holistically, behavior changing methods in which the built environment puts your health and well-being at the forefront.

MIND



Since the mind plays a vital role in an individual's overall health and well-being, as research continues to strongly show, it also becomes more apparent than ever to promote an atmosphere that supports a healthy mental state for psychological and physical benefit. A number of technologies and therapies, direct and indirect, can be put into place to promote relaxation and healing, improved sleep hygiene, the encouragement of altruism, community engagement, creative outlets and modalities, and an increased awareness of environmental factors that inform positive behavior change.

Chronic repeated stress activation within the body can be a damaging path for one's mental and physical health; in today's society, humans worry about the abstract and non-immediate resolvable issues on a regular basis, which inevitably leads to low mood, irritability, depression, and a negative sense of self. Chronic stress and anxiety are also directly responsible for a higher risk of heart disease, immunosuppression, gastrointestinal disorders, metabolic syndrome, and skin conditions. Mood disorders and mental health issues are significant and this comes as researchers are just beginning to study and unfold the effects of the SARS-CoV-2 pandemic. If, within, the healthy built environment we can work to identify and implement programming that positively impacts mood, sleep, stress, and psychosocial status, we enable an improved status in health and well-being.

Through well-intentioned features under the MIND concept, Lakehouse provides resources and strategies to optimize your cognitive and emotional health. In an urban space, it is important to produce exposure to views and images of nature, boosting positive emotion and producing a sense of calm. At Lakehouse, the building sits to provide views of not only the beautiful Rocky Mountains, but of Sloans Lake, and the downtown Denver cityscape. Biophilic design throughout the building interior and in the purposeful plans of the outdoor terrace, urban farm, and landscape gardens was created to nurture the innate human-nature connection. Deriving a measure of comfort and joy through MIND preconditions and optimizations allows the infrastructure to bring a sense of meaning, purpose, and delight to the resident's everyday lives.

Health literacy that is accessible and customized to the Lakehouse environment prompts health awareness. Through literature, educational sessions, and description of WELL features and their benefits, residents are able to find deeper understanding of health and wellness behaviors and how they relate to the building - on an individual and community level. With the pre- and post-occupancy surveys, built in conjunction and partnership with the Institute for the Built Environment at Colorado State University, Lakehouse is committed to measuring the extent to which the building is effectively promoting the health and comfort of its residents. By participating in this study, you are assisting in providing imperative feedback regarding health outcomes and behavior change tactics so Lakehouse, as an IWBI multi-family residential first, can be recognized and showcased for its positive impact. All forms of surveying, whether it be CSU research driven, or through self-monitoring and self-assessment tools, offers insight into the success of the WELL features and helps showcase the larger vision of how individuals can be impacted positively through behavioral and lifestyle changes while living in a healthy building, such as Lakehouse.

Not only do we want to shine a light on trackable metrics of health and wellness, such as improvement in heart rate variability, sleep routine (quality and duration), activity levels, and body mass/weight maintenance, there is so much qualitative data that can be derived from community programming and social cohesion. Altruism and creative connection are just two ways in which individuals can express their values, strengthen social relationships, and gain knowledge and experience. Activating a culture of health promotion and inclusivity by allowing residents to feel comfortable in areas they feel passionate about, all the while, trying new things outside of their comfort zone to promote growth and learning is how we instill and sustain social engagement. Health programming based on authentic resident participation and based in educational methodology, theory, and motivational interviewing provides Lakehouse with a real opportunity to build an operational portfolio of proven success within the healthy built environment you call home.

For more information, refer to the CSU presentation and the NAVA-Lakehouse Resident Wellness Manual.