The convergence of *green* and *wellness* in building standards

Empowering Trust™

Executive Summary

The concepts of health and wellness are rapidly gaining traction as essential elements in building efforts. This development reflects growing concerns about the impact of the modern workplace, borne out by recent research that establishes a link between workplace environments, employee health and productivity. As a result, a number of established green building standards have, over the years, incorporated health and wellness considerations into their certification criteria, providing certification credits for products and materials that offer demonstrable health advantages over comparable products.

This UL white paper will discuss the emergence of health and wellness criteria in the construction and furnishing of workplace environments, and how these efforts can contribute to a healthier and more productive workforce. The paper will also provide information on UL's Wellness Certification program for building products, finishes and furnishings.

The importance of wellness in the workplace

Since the passage of the U.S. Occupational Safety and Health Act in 1970, workplace-related injuries and illnesses in the U.S. have declined by as much at 73 percent.[1] Yet, according to the results of a widely-cited study based on a survey of nearly 30,000 U.S. workers, employee absenteeism and presenteeism[2] due to health-related causes results in the equivalent of nearly two hours per week in reduced workplace performance, with a total impact on productivity exceeding $225 billion each year.[3] And beyond the tangible costs, health-related absenteeism and presenteeism can lead to mistakes or errors in judgment that can compromise a company's ability to effectively compete in today's challenging global marketplace.

Against this backdrop, it's no surprise that as more and more companies seek to increase workforce productivity and contain costs, the health and wellness of employees have become a key focal point. Indeed, according to one study published in 2017, more than 90 percent of over 600 human resource leaders surveyed agreed that the physical health of employees has a significant impact on their engagement at work. Further, the majority of respondents noted that factors, including employee well-being and health, are key components of their overall business strategy, with 93 percent identifying employee well-being as a top HR initiative for the year.[4]

Increasingly, the quality of the workplace environment is being recognized as an important consideration in the health and wellness of employees. For example, in a 2016 study of occupants of ten office buildings in five U.S. cities, researchers determined that occupants of LEED-certified buildings scored more than 25 percent higher on cognitive function tests than occupants of buildings that had not achieved LEED certification. Green building study respondents also evidenced 30 percent fewer "sick building" symptoms than survey counterparts who did not work in green-certified buildings.[5]

Nearly 80 percent of building owners who can quantify the impact of their investments in healthy buildings cite improved employee satisfaction and engagement as a direct result of their decision to factor wellness considerations into their design decisions.[7]

Further evidence on the link between workplace wellness outcomes and building design and construction was presented in a 2016 report by the World Green Building Council. The report, "Building the Business Case: Health, Well-being and Productivity in Green Offices,"[6] cites numerous examples of how incorporating wellness considerations in building design can influence employee engagement and productivity. Here are some specific examples from the report:

- A move to a newly-constructed office facility in Doncaster, England (UK) rated "outstanding" under the BREEAM sustainability rating system resulted in marked decreases in workplace-related sick time for an international project development and construction company. The company reports that workers at the new facility experience an average of 3.5 times fewer building-related sick days, with a significant savings in costs related to absenteeism.
- An international marine contracting firm, whose headquarters in Amsterdam (the Netherlands) received an "excellent" rating under the BREEAM system, projects a net present value benefit of more than €42 million over 20 years due to increased productivity, staff retention and reduced absenteeism, according to an independent assessment conducted by accountancy firm KPMG.
- A corporate call center based in Malvern, PA (U.S.) attributes its significant increase in sales-generated leads and the number of sales leads per call to its new, LEED Platinum-certified building. The building's design provides views of the outdoors for 92 percent of the available offices and increases daylighting throughout the building by 25 percent.
- The installation of a simple "green wall" in the main conference room of a real estate services firm in San Francisco, CA (U.S.) reportedly resulted in a 39 percent reduction in the number of hours of elevated CO_2 (above 1000 ppm) in the firm's office space, leading to significant increases in employee focus and attention and greater workplace satisfaction.

These examples and other evidence of the connection between building design, construction and employee health are having a growing influence on design and construction decisions. Potential impacts on occupant health and wellness resulting from building-related issues are reportedly highly influential in decisions by developers in the design and construction of new buildings, as they attempt to improve the overall quality and appeal of their projects.

90%
OF OUR TIME
is spent indoors

The connection between indoor workplace environments and wellness

Today, people in industrialized counties spend about 90 percent of their time indoors.[8] As such, the quality of indoor environments plays an increasingly important role in overall human health and wellness.

Some of the key physical factors of indoor environments that can have an impact on health and wellness include:

- **Air quality –** Construction methods designed to increase a building's energy efficiency can also reduce the circulation of outside air. As a result, emissions from building construction materials and furnishings can linger in the air for longer periods of time, leading to elevated levels of volatile organic compounds (VOCs) and other common pollutants, and increases in certain health-related effects, such as asthma, eye, nose and throat irritation, allergic skin reactions, headaches, dizziness and fatigue.
- **Lighting –** Regular exposure to natural light promotes both good physical health and emotional well-being. However, most modern buildings primarily rely on artificial light to illuminate interior work spaces, utilizing lamps and luminaires based of light emitting diode (LED) technology. Although LED lighting is more energy-efficient than fluorescent or incandescent lighting, prolonged exposure to the optical radiation and other photobiological effects produced by LEDs can lead to irritation of the eye and the retina.
- **Thermal comfort –** Thermal comfort, including appropriate temperature and humidity levels, is essential for worker comfort and productivity. At the same time, although there is no single indoor temperature that ensures thermal comfort for everyone, many modern buildings provide little individual control over temperatures in specific locations. As a result, occupants often feel either too warm (making them prematurely tired) or too cold (which can make them distracted and unable to focus their attention).
- **Interior layout and furnishings –** Many interior workspace designs and arrangements are focused on promoting occupant interaction and engagement with others. But the widespread use of open space arrangements can also increase environmental noise and decrease the ability of occupants to concentrate when necessary. Further, individual workspace furnishings, such as desks, chairs and fixtures, often do not address important ergonomic considerations and fail to optimize occupant physical comfort throughout the workday.

Not only do these and other factors have a direct impact on occupant health and wellness, they can also contribute to decreased levels of productivity and higher rates of absenteeism and presenteeism. They can also lead to reduced levels of occupant engagement and satisfaction, resulting in higher employee turnover, increased labor and benefits expenditures for employers.

Building rating systems that incorporate wellness components

Over the past two decades, sustainability considerations have become a major factor in the design and construction of buildings intended for commercial, industrial and residential use. Initially borne out of efforts at the turn of the century to reduce energy consumption, sustainable buildings and construction practices now more broadly reflect the global interest in the conservation of all types of natural resources, as well as the reduction of waste generation both during and after a building's useful life. At the same time, sustainability standards have also evolved to address factors affecting human health and wellness, such as indoor air quality, lighting and thermal comfort.

BREEAM® Rating Systems

The health and wellness trends in building rating systems is perhaps best evidenced in the evolution of the available credits for certification under the most prominent environmental sustainability rating schemes for buildings. Established in the early 1990s, the Building Research Establishment's Environmental Assessment Method (BREEAM®) uses a comprehensive, quantifiable methodology to measure sustainability performance in accordance with a number of issues. Over time, the BREEAM assessment framework has continuously expanded in scope to more fully address building health and wellness issues.

Currently, the health and well-being category for BREEAM certification of new building construction and refurbishment assesses six separate areas of performance. These areas include "indoor environment," which addresses many of the specific health and wellness issues previously mentioned, including indoor air quality, thermal comfort, acoustic comfort, visual comfort and water quality. Other, more general health and wellness issues addressed under BREEAM include safety and security, ecology and outdoor space, active/healthy lifestyle, and health and well-being of users in surrounding areas.[9]

LEED® Building Rating System

A similar evolution has been seen in the Leadership in Energy and Environmental Design (LEED®) program, developed in 2000 by the U.S. Green Building Council (USGBC). The LEED building rating system framework uses a point system spread across a number of different categories to determine whether a specific building project qualifies for certification. Released in late 2013, LEED v4, the latest version of the LEED green building standard, incorporates credits for buildings that "enhance individual human health and well-being."

Credits within this health and well-being category are available for elements that "protect human health from direct exposure to negative health impacts," such as low VOC building materials, improved ventilation rates and improved construction management practices. Additional credits are available for building characteristics that "support occupant comfort and well-being," including improved daylighting, indoor acoustics and greater access to outdoor spaces.[10]

WELL Building Standard™

Developed in 2014 by the International WELL Building Institute (IWBI), the WELL Building Standard™ specifically addresses human health and wellness issues in buildings, interior spaces and planned communities. Version 1.0 of the standard is applicable to new and existing commercial and institutional buildings, and is intended to address building phases from design and construction through to operation of the completed structure.

The WELL Building Standard itself covers more than 100 different "features," some of which are required as a "precondition" for certification, while others are categorized as "optimization" that are optional. The individual features are allocated among the following WELL health and wellness concepts:

1. Air
2. Water
3. Nourishment
4. Light
5. Fitness
6. Comfort
7. Mind
8. Innovation

Each of the 100-plus features include a number of separate parts. For example, the "VOC reduction" feature under the Air concept (Feature 01) includes five separate parts, as follows: 1) interior paints and coatings; 2) interior adhesives and sealants; 3) flooring; 4) insulation; and 5) furniture and furnishings. Similarly, the Air concept's "Air quality standards" feature (Feature 01) includes three parts: 1) standards for volatile substances; 2) standards for particulate matter and inorganic gases; and 3) radon.

Fitwel® (The Center for Active Design)

One of the newest rating systems for assessing the health and wellness characteristics of buildings, Fitwel® was jointly developed by the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. General Services Administration (GSA). The Fitwel system was first piloted in 2014 in 89 U.S. public sector buildings, demonstrating the system's effectiveness as a tool for assessing the impact of specified building characteristics on occupant health and wellness. The Fitwel rating system is currently being administered by the Center for Active Design, a global not-for-profit organization.

The scorecard used to assess certification under the Fitwel rating system includes more than 55 design and operational strategies that are intended to address multiple aspects of workplace health and wellness, organized under the following 12 sections:

1. Location
2. Building access
3. Outdoor spaces
4. Entrances and ground floor
5. Stairwells
6. Indoor environment
7. Workspaces
8. Shared spaces
9. Water supply
10. Cafeterias and prepared food
11. Vending machines and snack bars
12. Emergency procedures

To illustrate, the section on "Indoor environment" includes five separate strategies, including "adopt and implement an indoor air quality (IAQ) policy" and "provide separate ventilation in all areas with chemical use or storage." The section "Workspaces" includes four strategies, including "provide access to sufficient active workstations," and "provide natural daylight in a majority of the workplace."

Other building rating systems, codes and standards

In addition to the building rating systems and standards discussed in the previous sections, there are a number of other rating systems that evaluate specific aspects of a building's health and wellness characteristics. For example, the Green Building Council of Australia's Green Star program and Singapore's Building and Construction Authority Green Mark scheme incorporate emissions requirements for products used in indoor environments. There are also a number of green building codes and standards that incorporate VOC emissions requirements, including the National Green Building Standard, which provides credit for reducing VOC levels, California's Green Building Standards Code (also known as CALGreen), and the International Green Construction Code (IgCC), the technical aspects of which are based upon the requirements of ASHRAE 189.1.

UL's approach to wellness certification

UL is a global leader in the testing and certification of building products for compliance with the requirements of the world's leading building rating systems and standards. UL's GREENGUARD Certification is recognized under the LEED, BREEAM, WELL and Fitwel rating systems in support of assessments related to VOC emissions. UL's Product Lens program helps building product manufacturers bring transparency to the chemical content of their products, and UL's furniture testing capabilities can help to identify ergonomic issues that can affect the health and wellness of building occupants.

In an effort to help architects, designers and specifiers identify products that can meet today's health and wellness requirements, UL has developed a new Wellness Certification program for building construction materials, fixtures and furnishings. UL's Wellness Certification program is designed to offer a comprehensive product assessment that is consistent with the latest developments in building rating systems that incorporate health and wellness criteria. This approach can provide manufacturers with a single testing and certification solution that can help to broaden acceptance of their products for selection and use in new building and construction projects.

UL's Wellness Certification involves a customized approach to each product, with UL professionals working with manufacturers to profile their products' attributes, and then evaluate them in connection with the product criteria of one or more building rating systems. Existing certifications can be used to document specific health and wellness attributes, and additional testing can be undertaken to address aspects that have not been previously evaluated. A final report and documentation package is then prepared, attesting that the product meets the specified health and wellness criteria.

Manufacturers, whose products are successfully evaluated under UL's Wellness Certification program, are authorized to use UL's Wellness Certification mark on their products. The authorized mark includes a QR code that links to the manufacturer's product page on UL's online database of certified products, making it easier to validate certification claims and to obtain specific information regarding the scope of the certification.

Summary + Conclusion

A building's health and wellness profile is increasingly being viewed by builders, developers and tenants alike as a critical, differentiating factor in the 21st century workplace. Buildings that are designed and operated to account for occupant health and wellness considerations are contributing to important gains in the overall health and well-being of occupants, as well as increasing occupant productivity, satisfaction and engagement. As such, manufacturers of building products, fixtures and furnishings are striving to meet health and wellness requirements of building rating systems and codes to help support their position in a highly-competitive market.

UL's Wellness Certification program provides product manufacturers with an efficient and effective pathway for demonstrating conformity with the health and wellness criteria of building rating systems. UL's Wellness Certification is complemented by UL's extensive portfolio of testing and certification services that can help product manufacturers meet both applicable regulations, as well as voluntary building standards and criteria. And UL's global network of testing laboratories can help facilitate the timely review and certification of building products, regardless of their location.

For further information about UL's Wellness Certification program, as well as other UL product testing services related to health and wellness characteristics, visit http://bit.ly/2JwYxvT.

End Notes

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