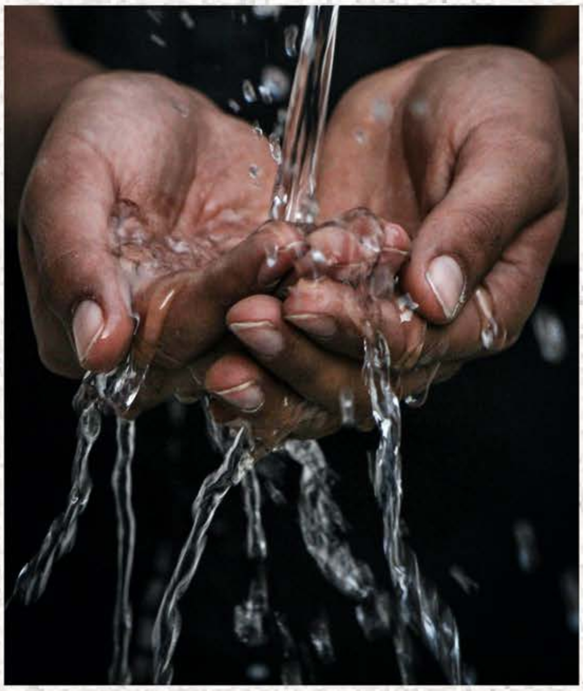
WELL

Performance Rating



INTERNATIONAL WELL BUILDING INSTITUTE

WELL PERFORMANCE RATED

WELL PERFORMANCE RATING, Q2 2025

INTRODUCTION

The WELL Performance Rating is a roadmap for leveraging building performance and occupant experience data to shift business decisions and organizational culture.

Informed by the WELL Building Standard, the WELL Performance Rating focuses on measurable building performance strategies that are verified through onsite testing and sensor technology. Performance measurements cover air, light and water quality as well as thermal and acoustic comfort. Occupant experience surveys connect building performance with the people inside, so organizations can make smarter decisions for their employees and business.

The WELL Performance Rating addresses seven themes related to performance including, indoor air quality, water quality management, lighting measurements, thermal conditions, acoustic performance, environmental monitoring and occupant experience. Upon achievement of the WELL Performance Rating, customers can expand their commitment to health and well-being by certifying the whole building or scaling their efforts across their entire organization. Strategies enacted through the WELL Performance Rating are automatically applied to a WELL Certification scorecard or WELL Score.

As organizations face the next stage of the COVID-19 pandemic, the WELL Performance Rating provides an efficient solution to monitor or meet specific performance thresholds related to indoor environmental quality (IEQ). Third-party verification and a visible seal upon achievement help communicate to anyone entering a building that it meets or exceeds industry recognized benchmarks for health.

The WELL Performance Rating: Rooted in Evidence and Technology

The WELL Performance Rating was created by the International WELL Building Institute (IWBI), the leading authority for transforming health and well-being with its people-first approach to buildings, organizations and communities. IWBI sets the global standard for health through its administration of the WELL Building Standard (WELL). Developed over 10 years and backed by the latest scientific research, WELL outlines key building-level and organizational strategies across 10 categories to support human health, well-being and performance.

The WELL Performance Rating is informed by:

- **120+ experts from the IWBI Performance Advisory and select WELL Concept Advisories** who are committed to driving rigor, evidence and scalability into the heart of the rating.
- **42 Performance Testing Organizations** that provide the on-site testing required for third-party verification of WELL worldwide.
- **10+ IWBI member organizations and smart building technology leaders** that shape the landscape of sensor technologies and drive the market toward real-time monitoring.
- **15+ WELL Enterprise Providers** that deliver comprehensive solutions for their clients.

The Critical Role of Environmental Monitoring

Monitoring through on-site testing or sensor technology helps organizations understand how their space is performing relative to industry benchmarks for health. Outcomes can be leveraged as actionable intelligence to improve business decisions and shift organizational culture.

The COVID-19 pandemic has highlighted the critical role indoor environments have on human health and well-being. Expectations for health leadership have shifted. ESG performance and reporting has emerged as a powerful driving force in the market as investors demand accountability from organizations. We're seeing record levels of vacancy in commercial office spaces and employee desire to return to work remains low. At the same time, as so often happens in crisis, we are experiencing a time of enormous innovation. More than 3.6 billion devices will be installed in commercial buildings next year. Understanding and acting on performance data is key to leveraging workplaces as an attraction and retention tool and demonstrating leadership in corporate social responsibility and ESG.

WELL Performance Rating Scope

The WELL Performance Rating includes more than 30 features across seven action areas:

- Indoor Air Quality
- Water Quality Management
- Lighting Measurement
- Thermal Conditions
- Acoustic Performance
- Environmental Monitoring
- Occupant Experience

Projects must achieve 21 points to achieve the WELL Performance Rating.

Features are verified through one or more of the following pathways:

- On-site, short-term test results conducted by a WELL Performance Testing Agent or other qualified professional
- Data collected from permanently installed continuous monitors
- Insights drawn from occupant experience reported through surveys and other methods

Some features may allow multiple pathways. For example, measurements of particulate matter (Feature PA1: Meet Thresholds for Particulate Matter) may come from permanently installed continuous monitors or a WELL Performance Testing Agent.

To maintain the WELL Performance Rating, projects undergo an annual renewal process to validate their performance data. The annual renewal process supports projects in maintaining high-quality spaces over time. Once complete, a successful annual renewal process results in an updated seal to reflect the project's performance over the last year.

Meeting the Needs of Today's Challenges

The WELL Performance Rating helps building operators monitor the conditions in their spaces and gather insights about occupant experience to drive business decision making. Since the rating is renewed annually, organizations can tailor their approach and make incremental progress and improvements over time.

As with the WELL Building Standard, the rating is designed to evolve over time to accommodate emerging technologies and methods for measuring building performance and occupant experience.

Stepping Stone in the WELL Journey

The WELL Performance Rating contains a subset of features in the WELL Building Standard that addresses a more comprehensive set of health topics. Adapted to focus specifically on measurable conditions, the WELL Performance Rating provides an accessible entry point to WELL for single locations, real-estate portfolios and organizations. Owners and operators can pursue the WELL Performance Rating as a standalone designation, leverage it as a stepping stone to achieve WELL Certification for a single location, or improve upon their WELL Score.

For additional details regarding WELL Core applicability, space types, occupant types and the WELL project boundary, please refer to the Overview of WELL v2.

Disclaimer

None of the parties involved in the development or creation of the WELL Performance Rating™ (and versions thereof and materials related thereto) including IWBI, its affiliates, and its and their respective owners, officers, directors, employees, agents, representatives, or contractors, assume any liability or responsibility to the user or any third parties for the accuracy, completeness, or use of or reliance on any information contained in the WELL Performance Rating, or for any injuries, losses, or damages (including, without limitation, equitable relief) arising from such use or reliance. Although the information contained in the WELL Performance Rating is believed to be reliable and accurate, all materials set forth within are provided without warranties of any kind, either express or implied, including but not limited to warranties of the accuracy or completeness of information or the suitability of the information for any particular purpose. The WELL Performance Rating and versions thereof and materials related thereto are intended to educate and assist organizations, building stakeholders, real estate owners, tenants and other users in their efforts to create healthier spaces, organizations and communities, and nothing in the WELL Performance Rating or versions thereof or materials related thereto should be considered, or used as a substitute for, quality control, safety analysis, legal compliance (including zoning), comprehensive urban planning, or medical advice, diagnosis or treatment. Achievement of the WELL Performance Rating does not in any way guarantee, represent or warrant that the individuals in a space, building or organization will be healthy or healthier, nor does it guarantee that a space will be free from viruses, pathogens, bacteria, allergens or volatile organic compounds. As a condition of use, the user covenants not to sue and agrees to waive and release IWBI, its affiliates, employees, or contractors from any and all claims, demands, and causes of action for any injuries, losses or damages (including, without limitation, equitable relief) that the user may now or hereafter have a right to assert against such parties as a result of the use of, or reliance on, the WELL Performance Rating and versions thereof or materials related thereto.

INDOOR AIR QUALITY

Indoor Air Quality aims to demonstrate achievement of high levels of indoor air quality across a building's lifetime. Projects are required to monitor key air quality parameters through on-site tests or sensors and meet certain thresholds for performance. By monitoring indoor air quality, projects can feel confident their spaces are high-performing and utilize data to drive ongoing maintenance strategies as well as design and human behavior interventions.

People spend approximately 90% of their time in enclosed spaces[1]– in homes, offices, schools or other building environments. During this time, inhalation exposure to indoor air pollutants can lead to a variety of negative short- and long-term health and well-being outcomes that can vary in severity. Less severe symptoms of exposure can include headaches, dry throat, eye irritation or runny nose, while more severe health outcomes can range from asthma attacks and carbon monoxide poisoning.[2–4] In the U.S. alone, indoor pollution contributes to thousands of cancer deaths and hundreds of thousands of respiratory health issues annually.[5] In addition to public health concerns, estimates by the U.S. Environmental Protection Agency suggest that net avoidable costs associated with indoor air pollution amount to well over $100 billion annually with 45% of those costs attributable to avoidable deaths from radon and environmental tobacco smoke, roughly 45% from lost productivity and about 10% from avoidable respiratory diseases.[5]

The most common indoor air contaminants are combustion sources, such as candles, tobacco products, stoves, furnaces and fireplaces, that release pollutants, such as carbon monoxide, nitrogen dioxide and small particles into the air.[6] Building materials, furnishings, fabrics, cleaning products, personal care products and air fresheners can also emit volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCs) into the indoor environment.[7,8]

Achieving the goal of clean indoor air requires both professionals and building users to engage not just in the conversation but also in the implementation of adequate approaches. Although indoor air quality can be managed primarily through eliminating the sources of air pollution and through adequate design solutions and human behavior modification,[5,9,10]some features require installation of a specific treatment method or technology.

It is evident that the impact of improving indoor air quality is substantial.[11] In a recent global burden of disease study, household air pollution was rated as the tenth most important cause of ill health for the world's population.[12] Furthermore, the World Health Organization estimated that, globally, air pollution contributed to approximately seven million premature deaths in 2012.[13] Around 600,000 of those were children under 5 years old.[14]

Indoor Air Quality features seek to promote clean air and minimize human exposure to harmful contaminants, to maximize benefits to productivity, health and well-being.

PA01 MEET THRESHOLDS FOR PARTICULATE MATTER | O (MAX: 1 PT)

Intent: Demonstrate indoor air quality meets basic thresholds for particulate matter.

Summary: This feature requires projects to meet basic, evidence-based thresholds for particulate matter as determined by public health authorities.

Issue: Inhalation exposure to particulate matter (PM), a mixture of suspended solid and liquid particles in the air, can lead to a variety of both short and long-term respiratory and cardiovascular health outcomes. Inhalable particulates can cause ear, nose, lung and throat irritation; coughing; sneezing; running nose and can exacerbate allergies and asthma. Additionally, fine particulates travel deep into the respiratory system and cross the gas-blood exchange barrier, which can lead to cardiovascular issues including hypertension and weakened blood vessels. Long-term exposure to fine particulate matter has been associated with an increased risk of strokes, heart attacks and lung cancer. [4–5]

Solutions: The World Health Organization and other regulatory bodies, such as the U.S. Environmental Protection Agency identify a list of "criteria" air pollutants, including $PM_{2.5}$ and PM_{10}. They have established permissible levels for such criteria pollutants based on epidemiological studies that show the relationships between concentrations of these pollutants, duration of exposure and health risks. Delivering clean indoor air requires collaboration between professionals and end users. Particulate matter levels can be managed through several strategies, such as filtration and positioning air intakes away from sources of pollution. These can be verified through on-site tests or sensors.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces except Commercial Kitchen Spaces & Industrial:

The following thresholds are met in occupiable spaces:

a. $PM_{2.5}$: 15 µg/m^3 or lower.[15]

b. PM_{10}: 50 µg/m^3 or lower.[16]

OR

For buildings where the annual average outdoor $PM_{2.5}$ level is 35 µg/m^3 or higher, the following thresholds are met:

a. $PM_{2.5}$: 25 µg/m^3 or lower.

b. PM_{10}: 50 µg/m^3 or lower.

OR

For buildings where the annual average outdoor $PM_{2.5}$ level is 35 µg/m^3 or higher, the following thresholds are met:

a. $PM_{2.5}$ less than or equal to 30% of the 24- or 48-hour average of outdoor levels on the day(s) of performance testing.

b. PM_{10} less than or equal to 30% of the 24- or 48-hour average of outdoor levels on the day(s) of performance testing.

For Commercial Kitchen Spaces & Industrial:

The following threshold is met:

a. $PM_{2.5}$: 35 µg/m^3 or lower.[15]

OR

For buildings where the annual average outdoor $PM_{2.5}$ level is 35 µg/m^3 or higher, the following thresholds are

a. $PM_{2.5}$ equal to 30% of the 24- or 48-hour average of outdoor levels on the day(s) of performance testing.

b. PM_{10} equal to 30% of the 24- or 48-hour average of outdoor levels on the day(s) of performance testing.

> **Note:**
> Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PA02 MEET ENHANCED THRESHOLDS FOR PARTICULATE MATTER | O (MAX: 2 PT)

Intent: Enhance health and well-being of people in buildings through improved levels of indoor particulate matter.

Summary: This WELL feature requires projects to meet more stringent particulate matter thresholds to further enhance human health and performance.

Issue: The quality of the air people breathe indoors directly impacts their health and well-being and is one of the most important aspects of buildings that can support human health. Inhalation exposure to particulate matter (PM), a mixture of suspended solid and liquid particles in the air, can lead to a variety of both short and long-term respiratory and cardiovascular health outcomes. Inhalable particulates can cause ear, nose, lung and throat irritation, coughing; sneezing; running nose and can exacerbate allergies and asthma.[4–5] Experts estimate that the premature mortality rate could be reduced by about 15% if PM_{10} is reduced from 70 to 20 µg/m^3.[17]

Solutions: Particulate matter levels can be managed through several strategies, such as filtration and positioning air intakes away from sources of pollution. These can be verified through on-site tests or sensors. In areas with poor outdoor air quality, a tighter building envelope (e.g., sealed windows, managed entryways) can limit pollution infiltration into an occupied space and dedicated air purification equipment can further capture and reduce particulate pollution in the ambient breathing space.

Part 1 Part 1 (Max: 2 Pt)

For All Spaces:

The following requirement is met:

a. Projects comply with the thresholds specified in the table below:

Tier	Particulate Matter Thresholds	Point Value
1	$PM_{2.5}$: 12 µg/m^3 or lower.[18] PM_{10}: 30 µg/m^3 or lower.[19]	1 point
2	$PM_{2.5}$: 10 µg/m^3 or lower.[19] PM_{10}: 20 µg/m^3 or lower.[19]	2 points

> **Note:**
> Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PA03 MEET THRESHOLDS FOR ORGANIC GASES | O (MAX: 1 PT)

Intent: Demonstrate indoor air quality meets basic thresholds for volatile organic compounds (VOCs).

Summary: This feature requires projects to meet basic, evidence-based levels of VOCs as determined by public health authorities and industry standards.

Issue: Volatile organic compounds (VOCs) are a broad set of organic compounds, many of which are manmade, that evaporate at room temperature. They are typically found as a gas. VOCs are emitted from a variety of solids and liquids such as industrial feedstocks and solvents, petroleum fuels, refrigerants, pesticides, paints, building materials, adhesives and cleaning supplies. VOCs are typically found at higher concentrations in indoor environments, and exposure can lead to an assortment of negative health outcomes including ear, nose, lung and throat irritation; coughing; sneezing; running nose; headaches; nausea; lethargy and can exacerbate allergies and asthma.[20] Certain individual VOCs are particularly harmful to humans. For example, formaldehyde—a common VOC—is a classified carcinogen, and exposure to it has been associated with an increased risk of leukemia nasopharyngeal cancers.[21]

Solutions: Many regulatory bodies, such as Health Canada and the California Office of Environmental Health Hazard Assessment have established permissible levels for VOCs, based on epidemiological studies that show the relationships between concentrations of these pollutants, duration of exposure and health risks. Delivering clean indoor air requires collaboration between professionals and end users. Indoor air quality can be properly managed through different strategies, including source control, passive and active building design and operation strategies and human behavior interventions. Indoor air quality can also be verified through on-site tests or sensors.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The following thresholds are met in occupiable spaces:

a. Benzene (CAS 71-43-2): 10 μg/m^3 or lower.[22]
b. Formaldehyde (CAS 50-00-0): 50 μg/m^3 or lower.[23]
c. Toluene (CAS 108-88-3): 300 μg/m^3 or lower.[24]

OR

The following threshold is met in occupiable spaces:

a. Total VOC: 500 μg/m^3 or lower.

> **Note:**
> Projects undergoing recertification/renewal that were previously awarded Feature PA3 must consider all data collected since the previous recertification/renwal.
>
> Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PA04 MEET ENHANCED THRESHOLDS FOR ORGANIC GASES | O (MAX: 1 PT)

Intent: Enhance the health and well-being of people in buildings through improved levels of indoor volatile organic compounds (VOCs).

Summary: This WELL feature requires projects meet more stringent thresholds for specific VOCs that have been linked to human health and performance.

Issue: Volatile organic compounds (VOCs) are a broad set of organic compounds, many of which are manufactured, that evaporate at room temperature. They are typically found as a gas. There are individual VOCs that are particularly harmful to humans. For example, formaldehyde—a common VOC—is a classified carcinogen, and exposure to it has been associated with an increased risk of developing leukemia nasopharyngeal cancers.[21] Setting threshold limits for common and harmful VOCs directly impacts occupant health and well-being and constitutes one of the most important aspects of buildings that can support human health.

Solutions: Indoor air quality can be properly managed primarily through source control strategies, passive and active building design and operation strategies and human behavior intervention. Achieving high levels of indoor air quality requires collaboration between professionals and end users. Indoor air quality can also be verified through on-site tests or sensors.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The following thresholds are met in occupiable spaces:

a. Acetaldehyde: 140 μg/m^3 or lower.[24]

b. One of the following:

   1. Acrylonitrile: 5 μg/m^3 or lower.[24]
   2. Caprolactam: 2.2 μg/m^3 or lower.[24]

c. Benzene: 3 μg/m^3 or lower.[24]

d. Formaldehyde: 9 μg/m^3 or lower.[24]

e. Naphthalene: 9 μg/m^3 or lower.[24]

f. Toluene: 300 μg/m^3 or lower.[24]

> **Note:**
> Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PA05 MEET THRESHOLDS FOR INORGANIC GASES | O (MAX: 1 PT)

Intent: Demonstrate indoor air quality meets basic thresholds for inorganic pollutants.

Summary: This feature requires projects to meet basic, evidence-based levels of carbon monoxide and ozone as determined by public health authorities and industry standards.

Issue: Carbon monoxide a is colorless and odorless gas generated as a byproduct of combustion. Common sources of combustion include automobile exhaust, stoves, gas ranges, furnaces and fireplaces. Common symptoms of carbon monoxide exposure include lethargy, dizziness, nausea, headaches and confusion. Exposure to high levels of carbon monoxide can lead to unconsciousness and even death.[25] Ozone is a colorless gas with a distinct odor often described as an "after the rain" smell. Ozone in the ambient airway is a secondary pollutant formed as a byproduct of UV light reacting with smog pollution such as nitrogen oxides and volatile organic compounds. Indoor sources of ozone include photocopiers, laser printers and certain air cleaning technologies. Exposure to ozone can cause ear, nose, lung, and throat irritation; coughing; chest pain; congestion and can exacerbate allergies and asthma.[26]

Solutions: The World Health Organization and other regulatory bodies, such as the U.S. Environmental Protection Agency identify a list of "criteria" air pollutants, including carbon monoxide and ozone. They have established permissible levels for such criteria pollutants based on epidemiological studies that show the relationships between concentrations of these pollutants, duration of exposure and health risks. Delivering clean indoor air requires collaboration between professionals and end users. Indoor air quality can be properly managed through source control, passive and active building design and operation strategies and human behavior interventions. These can be verified through on-site tests or sensors.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces except Commercial Kitchen Spaces & Industrial:

The following thresholds are met in occupiable spaces:

a. Carbon monoxide: 10 mg/m^3 [9 ppm] or lower.[15]
b. Ozone: 100 µg/m^3 [51 ppb] or lower.[19]

For Commercial Kitchen Spaces & Industrial:

The following thresholds are met:

a. Carbon monoxide: 34 mg/m^3 [30 ppm] or lower.[27]
b. Ozone: 100 µg/m^3 [51 ppb] or lower.[19]

> **Note:**
> Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PA06 MEET ENHANCED THRESHOLDS FOR INORGANIC GASES | O (MAX: 1 PT)

Intent: Enhance the health and well-being of people in buildings through improved levels of inorganic pollutants.

Summary: This WELL feature requires projects to go beyond current guidelines to provide lower carbon monoxide and nitrogen dioxide levels that have been linked to improved human health and performance.

Issue: Researchers have identified a clear relationship between indoor air quality and human productivity in buildings.[28] There is also an emerging body of evidence that air pollution can disrupt physical and cognitive development in children.[29] Studies have also shown that air pollution contributes to the large global burden of respiratory and allergic diseases, as well as the premature deaths of adults and children.[30] Setting threshold limits for carbon monoxide and nitrogen dioxide, two common ambient air pollutants, directly impacts occupant health and well-being and constitutes one of the most important ways that buildings that can support human health.

Solutions: Indoor air quality can be properly managed primarily through source control strategies, passive and active building design and operation strategies and human behavior intervention. High levels of indoor air quality require both professionals and building users to collaborate in the implementation of adequate approaches. Indoor air quality can also be verified through on-site testing or sensors.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The following thresholds are met:

a. Carbon monoxide: 7 mg/m^3 [6 ppm] or lower.[31]
b. Nitrogen dioxide: 40 $\mu g/m^3$ [21 ppb] or lower.[31]

> **Note:**
> Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PA07 ENSURE ADEQUATE VENTILATION | O (MAX: 1 PT)

Intent: Minimize indoor air quality issues by providing adequate ventilation.

Summary: This feature requires projects to demonstrate adequate mechanical and/or natural ventilation by meeting carbon dioxide thresholds.

Issue: Poorly ventilated spaces contribute to symptoms such as headache, fatigue, dizziness, nausea, cough, sneezing, shortness of breath and eye, nose, throat and skin irritation. This is collectively called sick building syndrome (SBS).[32,33] Poor ventilation is also linked to increased rates of employee absences, higher operational costs for businesses and decreased productivity in students.[34,35] One U.S.-based study reported that the sick leave attributable to insufficient provision of fresh air in buildings is estimated to be 35% of total absenteeism.[36] Therefore, the economic costs of SBS in under-ventilated buildings are significant and far exceed the energy-related cost savings.[37–39]

Solutions: Many indoor and outdoor sources of air pollution emit particulate matter and volatile organic compounds (VOCs) that can cause discomfort and trigger asthma and eye, nose and throat irritation. In order to maintain healthy indoor environments and acceptable air quality for building users, it is necessary to provide sufficient ventilation.[40,41] Since it is difficult to test for every potential pollutant, and because carbon dioxide (CO_2) is easy to detect, CO_2 levels serve as a proxy for other indoor pollutants. CO_2 thresholds are gaining popularity as a regulatory instrument. For example, the Belgian government has required the levels in buildings to be generally less than 900 ppm.[42,43]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

One of the following carbon dioxide thresholds is met in occupiable spaces:

a. 900 ppm or less.[42,43]

b. Not more than 500 ppm above outdoor levels.

> **Note:**
> Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PA08 INCREASE OUTDOOR AIR SUPPLY | O (MAX: 1 PT)

Intent: Expel internally generated pollutants and meet target concentrations of carbon dioxide to enhance health and well-being of people in buildings.

Summary: This WELL feature requires implementation of advanced ventilation strategies that can achieve higher air quality and thus benefit human health and productivity.

Issue: The majority of ventilation standards specify ventilation rates and other measures intended to provide indoor air quality that is merely "acceptable" to building users and reduces the risk of adverse health effects.[44] Even with proper ventilation designed to meet ventilation standards, the concentration of indoor pollutants can exceed concentrations found in outdoor air.[45,46] Ventilation rates less than 10 L/s per person in all building types are associated with negative perception of air quality and actual health outcomes.[47]

Solutions: Research suggests that an airflow rate significantly exceeding that recommended by standards is needed to minimize sick building syndrome symptoms and to improve human performance and productivity.[40,48] A review of multiple studies suggests that the risk of sick building syndrome symptoms decreases significantly when CO_2 concentrations are less than 800 ppm.[47]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

One of the following carbon dioxide thresholds is met in occupiable spaces:

a. 750 ppm or less.

b. Not more than 350 ppm above outdoor levels.

> **Note:**
> Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PA09 MEET THRESHOLDS FOR RADON | O (MAX: 1 PT)

Intent: Demonstrate indoor air quality meets basic thresholds for radon.

Summary: This feature requires projects to meet basic, evidence-based levels of radon as determined by public health authorities and industry standards.

Issue: Radon a is colorless and odorless radioactive gas that is the second leading cause of lung cancer, behind smoking.[49] Radon occurs naturally in the soil and infiltrates indoors through permeable building envelopes and foundations. Buildings with basements and sub-grade floors allow radon a greater opportunity to find its way indoors and accumulate within interior spaces. Radon exposure can lead to an assortment of negative health outcomes including coughing, hoarseness, wheezing, chest pain, lethargy, and frequent respiratory infections.

Solutions: Indoor air quality can be properly managed through passive and active building design and operation strategies. Effective mechanical ventilation is particularly effective at bringing radon below acceptable thresholds.[50,51]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The following threshold is met on the lowest regularly occupiable floor:

a. Radon: 0.15 Bq/L [4 pCi/L] or lower, as tested by a professional demonstrated not to have a conflict of interest with the WELL project or through continuous monitoring data. One test is conducted per 2,300 m^2 of regularly occupied space.

> **Note:**
> Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

APPENDIX 1:

Features of the WELL Building Standard describe which design, policy or environmental conditions must be present in a WELL Certified space. In other words, WELL features describe the characteristics or quality of the spaces in which we spend our time. Verification methods are the means through which projects document compliance with WELL requirements.

Please note that verification methods may vary based on the pathways chosen by the project.

Verification Method Types

There are two main categories of verification methods: documentation and on-site verification. All documentation is submitted through the WELL digital platform and evaluated by a WELL Reviewer to determine compliance with WELL requirements.

- Documentation:
  - Letter of Assurance
  - Technical Document
  - Professional Narrative
  - Policies and/or Operations Schedule
  - Sensor Data
  - On-going Data Report
- On-site verification:
  - On-site Measurements conducted by either a:
    - WELL Performance Testing Agent
    - Other qualified professional
  - On-site Photographs taken by either a:
    - WELL Performance Testing Agent
    - Project team (for projects implementing WELL across multiple locations)

Documentation

Letter of Assurance

Letters of Assurance affirm the project implemented the requirements as required during design, construction or operations. Templates are available for download in the digital standard. A Letter of Assurance designated to a particular member of the project team can be reassigned to a different member of the project team with the appropriate expertise.

- **Contractor:** A letter signed by the project contractor that confirms the project is constructed to meet the WELL requirements pursued.
- **Designer:** A letter signed by the project architect, lighting designer or acoustic consultant that confirms the project is designed to meet the WELL requirements pursued.
- **Engineer**: A letter signed by the project engineer that confirms the project is designed to meet the WELL requirements pursued.
- **Owner:** A letter signed by the project owner that confirms the project is constructed to meet the WELL requirements pursued.

Letters of Assurance are always accompanied by a second verification type (e.g., photograph), or a verification in another feature.

Technical Document

Technical Documents include several documentation types and are usually submitted during documentation review.

- **Architectural Drawings**: Technical drawings of a building or space that shows the floor plan.
- **Mechanical Drawings**: Technical drawings that show information about HVAC systems.
- **Modeling Reports**: The reports from a digital simulation software that demonstrates compliance with feature requirements.
- **Product Specification Sheets**: A document that outlines the technical information about an installed product which may include materials, functionality or environmental performance metrics (e.g., MSDS, cut sheets).
- **Maps:** A document that shows the topographical features of an area, including proximity of the WELL project to amenities specified in the requirements.
- **Remediation Reports:** A report that documents the results of risk reduction activities carried out once a hazard is

identified for a project. Remediation reports and associated activities are typically carried out and prepared by trained professionals.

- **Other:** A list of specific data that the project must provide to document compliance. This information is clarified in a verification note (available in this document and in the Verification Tab of the digital standard).

Professional Narrative

A professional narrative consists of a statement or summary written by a project team that describes how WELL requirements have been met in a space.

Policy and/or Operations Schedule

Policy documents and operation schedules communicate information to the occupants or staff in the space or other personnel involved with fulfilling feature requirements, unlike documents such as Letters of Assurance or Professional Narratives which are generated solely for the purposes of WELL Certification.

- **Policy Document:** A document that describes an enacted policy, program or initiative. Examples may include company handbooks, human resource documents, hiring protocols, all-staff emails or newsletters. Policies and laws enacted by a government that apply to a project may be submitted.
- **Operations Schedule**: A document outlining a schedule or cadence of events or activities that relate to WELL requirements.

Sensor Data

Some WELL features can be verified through data collected from permanently installed continuous monitors along with annotated drawings and photographs showing sensor placement. IWBI provides a structured template to simplify and streamline submission and review of this information here.

On-going Data Reports

Certain WELL features require documentation to be submitted annually. Reports are submitted to the WELL digital platform per the scheduled listed in the requirements and are not submitted for initial pursuit of WELL Certification or a WELL Rating.

- **Data Report:** The data output for WELL requirements that require ongoing monitoring or reporting. This may include survey data.
- **Maintenance Report:** A record demonstrating that ongoing maintenance activities (e.g., inspections, photographs taken by the project team) have been met.

Forms

- **Beta Feature Feedback Form:** A form with a series of questions relating to the experience of implementing of a beta feature. Available here: https://www.surveymonkey.com/r/7L3B3FM.

On-site Verification

Performance Test

Performance tests include a series of on-site measurements to gather data about the environmental conditions present in the space and document implementation of WELL features directly from the project site. Tests are conducted by a WELL Performance Testing Agent and in some cases can be conducted by another qualified professional (e.g., radon). Performance testing requirements, including methodologies and guidelines are outlined in the WELL Performance Verification Guidebook and also summarized in the Verification Tab of the digital standard. Data collected during on-site testing is submitted to the WELL digital platform and reviewed by a WELL Reviewer to determine compliance with the Performance Verification Guidebook and WELL requirements.

On-Site Photographs

Photographs supplement other types of documentation (e.g., Letters of Assurance). They are taken on-site by a WELL Performance Testing Agent and submitted to the WELL digital platform for review by a WELL Reviewer. Participants in the WELL Portfolio program may submit photographs taken by a member of the project team.

APPENDIX 2:

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WATER QUALITY MANAGEMENT

Water Quality Management covers aspects of the quality, distribution and control of liquid water in a building. It includes features that address the contaminant thresholds of drinking water. Monitoring water quality can help projects feel more confident about their spaces' performance and offer insights to drive ongoing maintenance strategies and design and human behavior interventions.

Nearly two-thirds of the human body is composed of water; it is a major component of cells and the dominant component of fluid between the cells.[52] Water is the medium for the transport of nutrients and waste throughout the body and helps to regulate the internal body temperature.[52] Depending on age, sex and pregnancy status, guidelines for water intake (including water in foods as well as direct consumption) recommend values between 2 and 3.7 L daily water consumption by adults.[52,53] These amounts are appropriate to offset what leaves the body through respiration, perspiration and excretion, aiding in the removal of toxins, byproducts and other waste.[51] However, many people are inadequately hydrated, even where safe water is available at the tap.[54–56] One contributing factor is the real or perceived quality of drinking water, as people who mistrust the safety of their water can be more likely to have lower intake of water and higher intake of sugar-sweetened beverages.[57]

Over the last hundred years, many parts of the world saw dramatic improvements in drinking water quality that triggered massive reductions in the prevalence of infectious diseases. The U.S. Centers for Disease Control and Prevention recognize this as one of the ten greatest public health achievements of the 20th century.[58] However, there has been increasing risk from industrial, agricultural and pharmaceutical pollution sources. Water with high levels of nitrate can impair oxygen transport in infants and lead exposure can impair neurodevelopment in children.[59] Moreover, some of the chemicals used for disinfecting drinking water may combine with natural organic matter and generate byproducts sometimes correlated with reproductive disease and cancer, such as trihalomethanes (THMs) and haloacetic acids (HAAs).[60] Overall, due to widely varying water quality across the globe, it is important to identify which (if any) contaminants are of concern on the local scale.[59] Only then is it possible to design water treatment systems that address the necessary contaminants without adding undue complexity and wastewater.

Water Quality Management features aim to increase the rate of adequate hydration in building users and reduce health risks due to contaminated water.

PW01 VERIFY WATER QUALITY INDICATORS | O (MAX: 1 PT)

Intent: Verify the quality of water designated for human contact through easy-to-test parameters.

Summary: This feature requires the provision of water that meets evidence-based thresholds for turbidity and coliforms for all water likely to come in contact with people (e.g., drinking, cooking and dishwashing, handwashing, showering or bathing), verified through on-site tests.

Issue: Most cities have an extensive treatment system to produce and deliver water with safety and integrity. Two parameters —total coliforms and turbidity— are commonly used to assess the effectiveness of these systems as easy-to-test measurements for the possible presence of other, more concerning contaminants, and are therefore known as "indicators". Coliform bacteria are naturally present in the environment and are generally considered harmless. However, some coliforms are associated with fecal contamination and may cause disease if ingested.[59] Turbidity is a measure of water cloudiness, which per-se does not constitute a health concern; however, it does relate to the availability of food and shelter for microbes, the presence of particulate contaminants and issues with the water treatment process,[59] along with posing an aesthetic concern. High turbidity water also can reduce the efficacy of water treatment technologies.[59]

Solutions: Water filtration can reduce turbidity and, depending on the type of device, may also trap bacteria and other contaminants. If the water has low turbidity, disinfection at the point of use with ultraviolet (UV) light may be effective at killing coliforms and pathogenic microbes.[61]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

Water delivered to the project and intended for human contact (e.g., drinking, cooking and dishwashing, handwashing, showering or bathing) meets the following thresholds:

a. Turbidity is less than or equal to 1.0 NTU, FTU or FNU (nephelometric turbidity, formazin turbidity or formazin nephelometric units, respectively).

b. Coliforms are not detected in any 100 ml sample.

> **Note:**
> Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PW02 MEET CHEMICAL THRESHOLDS | O (MAX: 1 PT)

Intent: Provide access to drinking water that complies with health-based chemical composition limits.

Summary: This feature requires projects to provide drinking water that meets thresholds on chemicals as published by research and regulatory organizations.

Issue: The chemical composition of drinking water, and therefore, its quality, changes from city to city and even within buildings due to the highly variable conditions of its sourcing, treatment and distribution within cities and inside buildings.[59] For example, natural deposits have caused arsenic to leach into some groundwaters to reach levels above drinking water health guidelines.[62] Water streams can also pick up contaminants from agricultural runoffs and direct industrial discharges,[63] whereas drinking water may encounter many opportunities to pick up contaminants in its travel from a treatment plant to the point of use, including corrosion byproducts such as lead and copper.[59] Disinfectants used to prevent microbial growth and render water potable, such as chlorine, may react with natural organic matter and yield unwanted disinfectant byproducts (DBPs) such as trihalomethanes (THMs) and haloacetic acids (HAAs), to which chronic exposure needs to be minimized.[60]

Solutions: Drinking water is treated and distributed to meet applicable legal requirements and regulations that may differ by country,[64] and many building-scale interventions can improve water quality depending on the contaminants that need to be removed. Typical technologies able to capture contaminants include activated carbon filters, ion exchange resins and reverse osmosis (RO) systems. Evaluating chemical parameters such as pH and free chlorine may help determine the potential for the uptake of corrosion byproducts and/or bacterial growth in drinking water.[59]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The following requirements are met:

a. The project provides at least one drinking water dispenser, plus one drinking water dispenser per dwelling unit (if applicable).

b. Drinking water dispensers provide water that meets the following parameters:[59]

1. Arsenic ≤ 0.01 mg/L.
2. Cadmium ≤ 0.003 mg/L.
3. Chromium (total) ≤ 0.05 mg/L.
4. Copper ≤ 2 mg/L.
5. Fluoride ≤ 1.5 mg/L.
6. Lead ≤ 0.01 mg/L.
7. Mercury (total) ≤ 0.006 mg/L.
8. Nickel ≤ 0.07 mg/L.
9. Nitrate ≤ 50 mg/L as Nitrate (11 mg/L as Nitrogen).
10. Nitrite ≤ 3 mg/L as Nitrite (0.9 mg/L as Nitrogen).
11. Total chlorine ≤ 5 mg/L.

c. Drinking water dispensers provide water that meets the following parameters:[63]

1. Residual (free) chlorine does not exceed 4 mg/L.
2. The concentration of total trihalomethanes (TTHM, sum of dibromochloromethane, bromodichloromethane, chloroform and bromoform) is 0.08 mg/L or less.
3. The concentration of haloacetic acids (HAA5, sum of chloroacetic, dichloroacetic, trichloroacetic, bromoacetic and dibromoacetic acids) is 0.06 mg/L or less.

> **Note:**
> Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PW03 MEET THRESHOLDS FOR ORGANICS AND PESTICIDES | O (MAX: 1 PT)

Intent: Provide access to drinking water that complies with health-based limits on organic contaminants and pesticides.

Summary: This feature requires projects to provide drinking water that meets thresholds for organics and pesticides as published by research and regulatory organizations.

Issue: The chemical composition of drinking water and, therefore, its quality, changes from city to city and even from building to building due to the highly variable conditions of its sourcing, treatment and distribution within cities and inside buildings.[59] Water streams can also pick up contaminants from agricultural runoffs and direct industrial discharges.[63]

Solutions: Drinking water is treated and distributed to meet applicable legal requirements and regulations that may differ by country,[64] and many building-scale interventions can improve water quality depending on the contaminants that need to be removed. Typical technologies able to capture contaminants include activated carbon filters, ion exchange resins and reverse osmosis (RO) systems.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The following requirements are met:

a. Testing must be conducted at drinking water dispensers for at least two of the pesticides from the list below. All contaminants in the list below that are reported by the lab must comply with the following thresholds:[59]

   1. Aldrin and Dieldrin (combined): 0.00003 mg/L or less.
   2. Atrazine: 0.1 mg/L or less.
   3. Carbofuran: 0.007 mg/L or less.
   4. Chlordane: 0.0002 mg/L or less.
   5. 2,4-Dichlorophenoxyacetic acid (2,4-D): 0.03 mg/L or less.
   6. Dichlorodiphenyltrichloroethane (DDT) and metabolites: 0.001 mg/L or less.
   7. Lindane: 0.002 mg/L or less.
   8. Pentachlorophenol (PCP): 0.009 mg/L or less.

b. Testing must be conducted at drinking water dispensers for at least three of the organic contaminants from the list below. All contaminants in the list below that are reported by the lab must comply with the following thresholds:[59]

   1. Benzene: 0.01 mg/L.
   2. Benzo[a]pyrene: 0.0007 mg/L.
   3. Carbon tetrachloride: 0.004 mg/L.
   4. 1,2-Dichloroethane: 0.03 mg/L.
   5. Tetrachloroethene (Tetrachloroethylene): 0.04 mg/L.
   6. Toluene: 0.7 mg/L.
   7. Trichloroethene (Trichloroethylene): 0.02 mg/L.
   8. 2,4,6-Trichlorophenol: 0.2 mg/L.
   9. Vinyl Chloride: 0.0003 mg/L.
   10. Xylenes (o-, m- and p-): 0.5 mg/L.

Note:
Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PW04 MEET THRESHOLDS FOR DRINKING WATER TASTE | O (MAX: 1 PT)

Intent: Provide access to drinking water that does not have an unpleasant taste, odor or appearance.

Summary: This feature requires projects to provide drinking water that meets thresholds on chemicals that affect aesthetics and taste concerns.

Issue: Even when health-based thresholds for water quality are met, water may be found unappealing to drink because of taste, odor and appearance concerns. For example, high levels of chloride contribute to a salty taste and iron can give the water a reddish appearance.[59] Therefore, some regulatory bodies set non-enforceable limits based on human detectability and acceptability for these substances.[65,66]

Solutions: Like pollutants with health-based concerns, the treatment system to address nuisance chemicals depends on the contaminant of interest. Treatment options include filtration with carbon media and reverse osmosis.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

Water delivered to the project for human consumption meets the following thresholds:

a. Aluminum ≤ 0.2 mg/L.[65]

b. Chloride ≤ 250 mg/L.[65]

c. Copper ≤ 1 mg/L.[65]

d. Manganese ≤ 0.05 mg/L.

e. Iron ≤ 0.3 mg/L.[65]

f. Silver≤ 0.1 mg/L.[65]

g. Sodium ≤ 270 mg/L.[66]

h. Sulfate ≤ 250 mg/L.[65]

i. Zinc ≤5 mg/L.[65]

j. Total Dissolved Solids (TDS) ≤ 500 mg/L.[65]

k. Free Chlorine ≤ 1.25 mg/L.[67]

Note:
Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

LIGHTING MEASUREMENTS

Lighting Assessment aims to create lighting environments that limit disruptions to occupants' circadian rhythm, promote visual acuity and foster mental and biological health.

Light is the main driver of the visual and circadian systems.[68] Light enters the human body through the eye, where it is sensed by photoreceptors in the retina that are linked to the visual and circadian systems. Humans are diurnal, meaning they are innately prone to wakefulness during the day and sleepiness at night. Light exposure stimulates the circadian system, which starts in the brain and regulates physiological rhythms throughout the body's tissues and organs, such as hormone levels and the sleep-wake cycle.[69] Humans and animals have internal clocks that synchronize physiological functions on a roughly 24-hour cycle called the circadian rhythm. The circadian rhythm is synchronized with the natural day-night cycle through different environmental cues, the main cue being light. Disruption or desynchronization of the circadian rhythm has been linked with obesity, diabetes, depression and metabolic disorders.[70–75] Exposure to bright light at night is associated with circadian phase disruption, which in turn can cause negative health effects, such as breast cancer and metabolic and sleep disorders.[68,73,76,77] High lighting levels at night, including light from bright screens, can contribute to the disruption of the circadian rhythm.[70]

All light—not just sunlight—can contribute to circadian photoentrainment.[78] Given that people spend much of their waking day indoors, insufficient illumination or improper lighting design can lead to drifting of the circadian phase, especially if paired with inappropriate light exposure at night.[79] Humans are continuously sensitive to light, and under normal circumstances, light exposure in the late night/early morning will shift our rhythms forward (phase advance), whereas exposure in the late afternoon/early night will shift our rhythms back (phase delay).[79] Phase delays and phase advances in the circadian rhythm can impact sleep-wake cycles and desynchronize circadian rhythms. To maintain optimal, properly synchronized circadian rhythms, the body requires periods of both light and darkness.[78,80]

The lighting environments where humans spend their time impact their visual, circadian and mental health. Lighting conditions in most spaces are usually designed to meet the visual needs of individuals but do not consider circadian and mental health. This presents an opportunity for projects to provide lighting conditions required by humans for improved health and well-being. Understanding the specific needs and preferences of users in a space is integral to creating effective lighting environments. Environments that take into account these lighting strategies and user needs can contribute to improvement of the overall mood and increase the productivity of employees.[68,70]

Lighting Measurement features aim to provide a lighting environment that reduces circadian phase disruption, improves sleep quality and positively impacts mood and productivity.

PL01 PROVIDE VISUAL ACUITY | O (MAX: 1 PT)

Intent: Provide visual comfort and enhance visual acuity for all users through electric lighting.

Summary: This feature requires projects to provide appropriate illuminance on work planes for regular users of all age groups, as required for the tasks performed in the space.

Issue: Humans perceive the world through visual cues that are received through images formed on the retina of the eye. The light levels in a space can enhance the user's ability to perform tasks in that space, while contributing to the feeling of spaciousness. The age of the individual is also a factor in the amount of light required for visual acuity. As humans age, the transmission of light through their lenses is reduced. This is due to age-related changes, including increased light absorption by the lenses, smaller pupil size, increased scattering of light due to thicker lenses and yellowing of the lenses.[81,82] This aging of the eye indicates that an increase in light levels is required to ensure visual acuity.

Solutions: While developing a lighting strategy to accommodate the visual acuity of users, it is critical to take into account the tasks conducted, as well as the age of the users. Projects may refer to published recommendations by lighting associations or authorities on using electric lighting design strategies for light levels required on the work plane. Lighting recommendations published by authorities provide a range of lighting levels for different age groups and tasks.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces except Dwelling Units:

The following requirements are met:

a. All indoor and outdoor spaces (including transition areas) comply with the illuminance thresholds specified in one of the following lighting reference guidelines:

   1. IES Lighting Library, Lighting Applications Standards Collection.[83]
   2. EN 12464-1:2021 or EN 12464-2:2014.[84]
   3. ISO 8995-1:2002(E) (CIE S 008/E:2001).[85]
   4. GB50034-2013.[86]
   5. CIBSE SLL Code for Lighting.[87]

b. The illuminance thresholds take into consideration the tasks and the age groups of the occupants.

OR

The following requirements are met:

a. More than 50% of the occupants are under the age of 65.

b. At least 90% of the project area is composed of the following space types and meets the associated illuminance thresholds:[88]

   1. Offices and classrooms: minimum 320 lux at task surface.
   2. Lobby, atrium and transition (including corridor and outdoor pathways): minimum 110 lux at floor level.
   3. Storage spaces: minimum 110 lux at floor level.
   4. Dining, Lounge and Restrooms: minimum 110 lux at task surface.

For Dwelling Units:

The following requirements are met:

a. Lighting is installed in kitchens and bathrooms to comply with the illuminance thresholds specified in one of the following lighting reference guidelines:

   1. IES Lighting Library, Lighting Applications Standards Collection.[83]
   2. ISO 8995-1:2002(E) (CIE S 008/E:2001).[85]
   3. GB50034-2013.[86]
   4. CIBSE SLL Code for Lighting.[87]

b. For spaces where lighting is not installed, the following is provided to all tenants:

   1. Illuminance thresholds for common tasks conducted in spaces.
   2. Specifications, quantity and location of light fixtures required to meet light levels based on sample layout.

Note:
Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PL02 LIGHTING FOR DAY-ACTIVE PEOPLE | O (MAX: 2 PT)

Intent: Support circadian and psychological health through indoor daylight exposure and outdoor views.

Summary: This feature requires projects to provide users with appropriate exposure to light for maintaining circadian health and aligning the circadian rhythm with the day-night cycle.

Issue: Our body's circadian rhythms are kept in sync by various cues, including light. Humans have evolved to base their circadian rhythms around the natural light-dark patterns associated with daytime and night-time. However, with humans being indoors for extended periods of time, exposure to adequate levels of light have been compromised as typical indoor electric light levels often do not equate to the amount of light the human body traditionally receives outdoors.[89] Light deficiencies affect the functioning of the circadian system and quality of sleep. Disruption of the circadian rhythm has been linked with obesity, diabetes, depression and other metabolic disorders.[70-77,90] Exposure to light at night has also been associated with negative health effects, such as breast cancer, circadian phase disruption and sleep disorders.[68,76]

Solutions: Since the circadian response of humans to light is dependent on the light that enters the eye, factors such as spectral properties of the light, brightness levels, duration and timing of exposure should be considered. The light levels must be achieved on the vertical plane, at the eye level of the occupant to simulate the light entering the eye of the user.[91,92] It is also important to consider the duration of exposure to light, as well as the timing of exposure. Stimulating the circadian system at night through exposure to bright light can negatively impact sleep quality.[68,93,94]

Part 1 Part 1 (Max: 2 Pt)

For All Spaces except Dwelling Units & Guest Rooms:

For workstations used during the daytime, electric lighting is used to achieve the following thresholds:

a. The following light levels are achieved for at least four hours (beginning by noon at the latest) at a height of 18 in [45 cm] above the work-plane for all workstations in regularly occupied spaces:

Tier	Threshold		Threshold for Projects with Enhanced Daylight	Point Value
1	At least 150 EML [136 melanopic EDI]	OR	The project achieves at least 120 EML [109 melanopic EDI] and either WELL v2 Feature L05 Part 1 or L06 Part 1.	1 point
2	At least 275 EML [250 melanopic EDI][94]	OR	At least 180 EML [163 melanopic EDI] and either WELL v2 Feature L05 Part 1 or L06 Part 1.	2 points

b. The light levels are achieved on the vertical plane at eye level to simulate the light entering the eye of the occupant.

For Dwelling Units & Guest Rooms:

The following requirements are met in each dwelling unit:

a. Electric light is used to achieve the following light levels:

Tier	Threshold		Threshold for Projects with Enhanced Daylight	Point Value
1	At least 150 EML [136 melanopic EDI]	OR	At least 120 EML [109 melanipic EDI] and either WELL v2 Feature L05 Part 1 or L06 Part 1.	1 point
2	At least 275 EML [250 melanopic EDI][94]	OR	At least 180 EML [163 melanopic EDI] and either WELL v2 Feature L05 Part 1 or L06 Part 1.	2 points

b. The light levels are dimmable. If automated lighting is used, it is automatically dimmed after 8:00 pm.

c. The light levels are achieved in living rooms and kitchens at a height of 140 cm in the center of the room. For studio apartments and guestrooms without living rooms, also test in the center of the room. If workstations are present, light levels are achieved at a height of 45 cm above the work-plane.

Note:
Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

THERMAL CONDITIONS

Thermal Conditions aims to provide a maximum level of thermal comfort among all building users through improved HVAC system design and control and by meeting individual thermal preferences.

Thermal comfort is defined as "the condition of mind that expresses satisfaction with the thermal environment and is assessed by subjective evaluation."[96] Thermal comfort greatly influences our experiences in the places where we live and work. It is one of the highest contributing factors influencing overall human satisfaction in buildings impacting individual levels of motivation, alertness, focus and mood.[97–100] Its influence on the integumentary, endocrine and respiratory systems also allows thermal comfort to play a large role in our health, well-being and productivity. Beyond the scope of individual impact, the indoor thermal environment also impacts a building's energy use, since cooling and heating in developed and many developing countries account for approximately half of a building's energy consumption.[101,102]

Despite technological advancements, great improvements in our understanding of thermal comfort in buildings, and existing standards establishing specific criteria for buildings to provide an acceptable thermal environment for a minimum 80% of occupants,[103] many people still feel uncomfortable during the work day.[104,105] In fact, studies have shown only 11% of the office buildings surveyed in the U.S. provided thermal environments that met accepted goals of human satisfaction.[106] Moreover, as many as 41% of office workers have expressed dissatisfaction with their thermal environment.[106] Such levels of dissatisfaction may be detrimental not only to the individual but also the business at large, because leading research indicates that employees perform on average 15% poorer in hot conditions and on average 14% poorer in cold conditions.[107] In contrast to those who are dissatisfied with thermal conditions, office workers who are satisfied with their thermal environment can be more productive in the workplace.[106]

Thermal comfort is subjective, which means that not everyone will be equally comfortable under the same conditions. This highlights that a one-size-fits-all approach to thermal comfort in buildings invariably fails for large numbers of people.[108] A comfortable thermal environment that satisfies all occupants is challenging to achieve, due to individual preferences and possible spatial and temporal variations in the thermal environment.[109] Due to the difficulties of setting temperature levels that suit all individual preferences[96], thermal comfort conditions should create baseline satisfaction for the largest number of people.

Thermal Conditions features require interventions to provide comfortable thermal conditions to most building users supporting human health, well-being and productivity.

PT01 PROVIDE ACCEPTABLE THERMAL ENVIRONMENT | O (MAX: 1 PT)

Intent: Provide a thermal environment that the majority of building users find acceptable.

Summary: This WELL feature requires projects to create indoor thermal environments that provide comfortable thermal conditions to the majority of people in support of their health, well-being and productivity

Issue: The thermal environment substantially impacts a building's energy footprint, and in many countries heating and cooling account for approximately half of a building's energy consumption.[110,111] Furthermore, the indoor thermal environment is ranked as one of the strongest contributing factors to overall human satisfaction in the built environment.[112] The thermal environment not only impacts comfort and productivity, but due to its linkages to integumentary, endocrine and respiratory body systems, lack of thermal comfort can also cause a variety of detrimental health outcomes.[113,114] Overly warm indoor spaces are linked to increases in sick building syndrome symptoms, irregular heart rate, respiratory issues, fatigue and negative mood.[115] Cold work environments have been linked to increased effort and work towards maintaining proper posture and increased risk for chronic issues related to musculoskeletal health.[116]

Solutions: Thermal comfort standards utilize a model that provides a means of predicting whether humans in a mechanically conditioned space will be satisfied with the thermal environment based on six core parameters: air temperature, humidity, air movement, mean radiant temperature of surrounding surfaces, metabolic rate and clothing insulation.[117,118] For naturally conditioned buildings, the adaptive thermal comfort model correlates human comfort directly with indoor operative temperature and outdoor temperature.[119,120] Achieving thermal satisfaction among people requires some level of control over thermal comfort parameters in any given environment.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces except Commercial Kitchen Spaces:

The following requirements are met, as applicable:

a. Mechanically conditioned regularly occupied spaces meet thermal comfort conditions of PMV +/- 0.5 for at least 90% of occupied hours in at least 90% of regularly occupied spaces.[121]

b. Naturally conditioned regularly occupied spaces meet all the following conditions:[120]

	Prevailing mean outdoor temperature, $t_{pma(out)}$	Indoor operative temperature	Notes
Minimum	10 °C	$t_{pma(out)} \times 0.31 +$ 14.3 °C	N/A
Maximum	33.5 °C	$t_{pma(out)} \times 0.31 +$ 21.3 °C	Occupant-controlled elevated air speed may be used to increase this maximum per ASHRAE 55

c. Mixed-mode-conditioned spaces meet the requirements for both mechanically and naturally conditioned spaces, when each is in operation.

OR

The following requirements are met:

a. Project meets Feature PM4 Monitor Thermal Environment.

b. Sensor data demonstrate parameters meet one of the following:

   1. One of the PMV or temperature ranges described in Option 1. Dry bulb temperature may be used in place of operative temperature. Naturally conditioned projects must also measure outdoor air temperature.
   2. Dry bulb temperature is between 21-25 °C for occupied hours.[122] The designed air velocity is not more than 0.2 m/s at 1.7 m above the floor.

For Commercial Kitchen Spaces:

The following requirement is met:

a. The operative temperature in the kitchen does not exceed 27 °C.

Note:
Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PT02 MANAGE RELATIVE HUMIDITY | O (MAX: 1 PT)

Intent: Limit the growth of pathogens, reduce off-gassing and maintain thermal comfort by providing the appropriate level of humidity.

Summary: This WELL feature requires projects to maintain optimum relative humidity levels that are conducive to human health and well-being.

Issue: When air temperature is within a comfortable range for occupants, the effects of humidity on thermal comfort can generally be inconsequential.[123] However, in warm temperature settings, humidity can increase the degradation of building materials, limit the ability of the human body to release heat through evaporation and increase levels of discomfort from excess moisture on the skin.[123–125] If the humidity is too high, the human body has a limited capacity to cool down through sweating.[126] Warm and humid indoor spaces are also associated with mold and fungal growth.[127]Moreover, humidity in warm spaces may promote the accumulation and growth of microbial pathogens, including bacteria and dust mites which can lead to odors and cause respiratory irritation and allergies in sensitive individuals.[127] Conversely, cold and dry spaces can lead to discomfort and irritation of the airways, skin, eyes, throat and mucous membranes and facilitate the spread of the influenza virus.[128–130]

Solutions: Buildings situated in climates with broad humidity ranges can maintain relative humidity within healthy and comfortable levels by utilizing de/humidification systems to add or remove moisture from the air. Isolating high-moisture areas from regularly occupied spaces and ensuring increased mechanical exhaust provisions can also help to control humidity in buildings.[131]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The following requirement is met in all regularly occupied areas, except high-humidity areas:

a. The mechanical system has the capability of maintaining relative humidity between 30% and 60% at all times by adding or removing moisture from the air.[132,133]

OR

The following requirements are met:

a. Project meets Feature PM4 Monitor Thermal Environment.

b. Relative humidity levels in regularly occupied areas, except high-humidity spaces, are between 30% and 60% during occupied hours.

Note:
Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

ACOUSTIC PERFORMANCE

Acoustic Performance aims to bolster occupant health and well-being through the identification and mitigation of acoustical comfort parameters that shape occupant experiences in the built environment.

The acoustical comfort of a space can be quantified by the overall level of satisfaction of a person in a given environment.[134,135] The word "sound" itself is generally defined as the human response to mechanical vibrations through a medium, such as air. By this definition, human perception of sound is paramount in shaping a sonic environment.

Only in recent years has it been determined that exposure to noise sources, such as traffic and transportation can hinder the health and well-being of people.[97,136] For instance, the effects of exterior noise from transportation or industrial sources have been linked to sleep disturbance, hypertension and the reduction of mental arithmetic skills in school-aged children.[137–142] In one study taken from a sample size of 4,115 participants, it was found that the risk for myocardial infarction was elevated in men from road traffic noise at night and in women by air traffic noise at night.[143] A number of studies have also indicated that internally generated noise is a major cause of complaint and ultimately results in occupant dissatisfaction.[134,144–147]

Sound within an enclosed space from sources, such as HVAC equipment, appliances and other people has been shown to hinder productivity, focus, memory retention and mental arithmetic in school children, university students and office employees.[141,145,146,148–151] In addition to airborne noise sources, impact of noise from adjacent activity, such as footfall, exercise equipment or mechanical equipment vibration can create uncomfortable environments for occupants located nearby.[148,152] Another common acoustical issue is lack of privacy within and between enclosed spaces. For instance, research has indicated that occupants are generally dissatisfied when conversations can readily transmit between rooms or across an open office, thus hindering confidentiality or creating a distraction from tasks.[153] Inappropriate reverberation times and background noise levels in a space can impede speech intelligibility and cause strain for occupants who may possess hearing impairments.[154–157] Speech intelligibility is also a crucial element in educational facilities, where information is being presented to large audiences and aural comprehension is vital for memory retention and task completion.[158]

With the rise in hearing impairments and various other health concerns as a result of over-exposure to noise, designing a single space to meet the acoustical comfort needs of every individual is challenging. However, existing research into the effects of best-practice acoustical design within a space suggests that a holistic approach to addressing the issue of acoustical comfort in the built environment is achievable.[146,148,159] The planning and commissioning of an isolated and balanced HVAC system provides a firm baseline for the anticipated background noise level in a given enclosure.[148] With the fortification of façade elements, exterior noise intrusion can be subdued, much to the benefit of occupant comfort, health and productivity.[137,139,160–165] Replacing areas of hard surfaces in a space with absorptive materials can reduce reflected sound energy and better facilitate acoustical privacy or, conversely, improve speech projection.[154,159,166,167]

Acoustic Performance features aim to address the concerns of acoustical comfort through research-based design considerations that buildings can accommodate for the purposes of improving occupant health and well-being.

PS01 LIMIT BACKGROUND NOISE LEVELS | O (MAX: 2 PT)

Intent: Achieve desired ambient noise levels to limit the impact of HVAC, exterior noise intrusion or other noise sources on health and well-being.

Summary: This feature prescribes maximum thresholds for ambient background noise that correspond to optimal levels of interior and exterior noise exposure.

Issue: All spaces have some degree of ambient background noise from HVAC equipment, exterior sources (e.g., traffic, outdoor equipment, pedestrians) or other building services. When the sum of these noise sources exceeds comfortable levels, the space may not function as intended. For instance, elevated levels of background noise can impact the perception of public address systems and diminish the perception of spoken word, which reduces critical listening ability and task performance.[168–173] Studies indicate that employees are unable to habituate to noise in office environments over time, and office noise, with or without speech, can create stress and disrupt performance on more complex cognitive tasks (e.g., memory of prose, mental arithmetic).[166,174–177] Studies have shown that exposure to traffic noise can lead to increased risk of cardiovascular system issues, diabetes, hypertension, stroke, depression and high blood pressure.[139,140,143,178–180] For children, chronic aircraft noise exposure impairs reading comprehension, mental arithmetic and proofreading.[141,172,181–183]

Solutions: Interior noise sources can be controlled by selecting HVAC equipment with lower sound ratings and by designing the system to reduce sound within ducts.[148] Exterior noise can be controlled by providing sound reduction at the building façade, windows and any exterior penetrations.[184] In both cases, these sound sources are easier to control when considered at the earliest possible stages of design.[159,185,186]

Part 1 Part 1 (Max: 2 Pt)

Note:
Category 1 Room Types:

- Areas for conferencing

- Areas for learning

- Areas for speaking

Category 2 Room Types:

- Enclosed areas for concentration

Category 3 Room Types:

- Open areas for concentration

- Areas with regularly used PA systems

- Areas for dining (excluding kitchenettes)

Category 4 Room Types:

- Areas with machinery and appliances used by occupants (e.g., baggage handling areas, security, commercial kitchens, kitchenettes, labs where spoken lectures do not take place)

Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

For All Spaces except Dwelling Units & Guest Rooms:

The following requirement is met:

a. Background noise levels do not exceed the following thresholds, as applicable:

Tier	Sound Pressure Level (SPL)		Category 4:	Category 3:	Category 2:	Category 1:	Point Value
1	Average SPL (Leq)	dBA	55	50	45	40	1 point
		dBC	75	70	65	60	
	90th percentile SPL (L10)	dBA	65	60	55	50	
2	Average SPL (Leq)	dBA	50	45	40	35	2 points
		dBC	70	65	60	55	

90th percentile SPL (L10)	dBA	60	55	50	45

For Dwelling Units & Guest Rooms:

The following requirement is met:

a. Average background noise levels in bedrooms, when measured over a 12-hour minimum time period (which must include the hours of 10 pm to 7 am), do not exceed 35 dBA (Leq).[187]

PS02 ACHIEVE SOUND ISOLATION AT WALLS | O (MAX: 1 PT)

Intent: Increase the level of sound isolation and speech privacy between enclosed spaces.

Summary: This feature requires that walls meet a minimum degree of acoustical separation to provide adequate sound isolation and improve speech privacy.

Issue: Sound that transmits from one room to another through walls can be distracting or annoying and also disturb sleep.[188–192] There is evidence that links noise annoyance in multi-story housing to poor mental health and perceived stress in residents.[193,194] Speech privacy is also reduced when background sound in receiving rooms is lower as part of the room's intent (e.g., bedroom, restorative space, classroom).[188,195] For walls, lightweight construction, glass and demountable partitions are typical in modern design and offer minimum acoustic separation and speech privacy, especially when wall construction is not uniform.[196–198]

Solutions: Sound transmits through walls directly and around the construction by what is known as flanking. Walls with high sound transmission class ratings (STC) will provide sound isolation, only when the wall is constructed to reduce flanking at points where the wall connects to other building elements. Windows, glass fins or other penetrations diminish performance and should be used sparingly. Rooms that require high speech privacy can use sound masking systems, in addition to high-performing walls to increase privacy.[195]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

For walls that separate regularly occupied spaces, the following requirements are met:

a. The projects meet the following minimum Noise Isolation Class (NIC) or Weighted Difference Level (Dw) for each wall type, as applicable. If an interior wall meets multiple categories listed, use the highest NIC/Dw value listed.

Interior Wall Type	Minimum NIC or Dw
Between Loud zones and regularly occupied spaces.	55
Between areas for conferencing, learning or sleep and other regularly occupied spaces.	50
Between adjacent Quiet zones.	45
Between rooms for concentration and other regularly occupied spaces.	40
Between Circulation zones and regularly occupied spaces.	35

OR

For walls that separate regularly occupied spaces, the following requirements are met:

a. The sum of the measured Noise Isolation Class (NIC) or Weighted Difference Level (Dw) combined with the Noise Criteria Rating (NC) or A-weighted Sound Pressure Level (LAeq) within a room achieves the following minimum values, as applicable. If an interior wall meets multiple categories listed, use the highest value listed.

Source Room	Receiver Room	Minimum NIC + NC or Dw + LAeq
Enclosed Loud zones	Open areas for concentration Circulation zones	80
	All other occupiable areas	85
Enclosed areas for conferencing Enclosed areas for learning Enclosed areas for sleeping	Open areas for concentration Circulation zones	75
	Enclosed quiet zones	80
	Enclosed areas for conferencing Enclosed areas for learning Enclosed areas for sleeping	85
	Open areas for concentration Circulation zones	70

Enclosed quiet zones	Enclosed quiet zones	75
	Enclosed areas for conferencing	
	Enclosed areas for learning	80
	Enclosed areas for sleeping	

Note:
Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PS03 ACHIEVE REVERBERATION TIME THRESHOLDS | O (MAX: 1 PT)

Intent: Design spaces in accordance with reverberation times that support speech intelligibility, vocal effort and are conducive to concentration.

Summary: This feature requires that steps be taken to address acoustical comfort, by controlling reverberation time based on room functionality.

Issue: Reverberation time is the length of time taken for a sound to decay by 60 dB from an initial impulse level. The length of reverberation time is a function of room size, surface area and sound absorbing properties of surface finishes. Spaces with longer reverberation times may be larger in volume with hard surfaces that reflect sound. Spaces with shorter reverberation may be smaller with softer surfaces that absorb sound. Spaces with high reverberation may have increased ambient noise levels and reduce speech intelligibility (e.g., public address, speech reinforcement, unamplified speech). Studies have shown that high reverberation times in classrooms increase auditory workload in students and reduce cognition, memory retention and concentration.[141,157,161,199] Similarly, studies have shown that high reverberation reduces speech intelligibility among hard of hearing and non-native speaking populations.[155,200–202]

Solutions: Reverberation time can be controlled by adding absorptive surface finishes at ceilings, walls and furniture.[186,203,204]Projects that can alter room geometry can change layouts and room dimensions to support optimal reverberation times, as needed. Reducing reflective surfaces, such as glass, drywall, stone or similar, will also reduce reflected sound energy, which increases reverberation time. Reducing reverberation time also allows audio equipment for telecommunication/AV, speech reinforcement or public address to operate with higher speech intelligibility performance.[200,205–207]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces except Dwelling Units & Guest Rooms:

For projects in which the room types listed in the table cumulatively make up at least 10% of occupiable project area, the following requirements are met:

a. Reverberation time is within the ranges shown in the following table:

Room Type	Room Volume, v (cubic meters)	Reverberation Time, t (seconds)
Areas for learning	$v \leq 280\ m^3$	$t \leq 0.6$[186]
Areas for lectures	$280\ m^3 \leq v \leq 570\ m^3$	$t \leq 0.8$[203]
Areas for conferencing	$v \geq 570\ m^3$	$t \leq 1.0$[203]
Areas with regularly used PA systems	N/A	$t \leq 1.5$
Areas for dining	N/A	$t \leq 1.0$[200]
	$v \leq 280\ m^3$	$t \leq 0.8$[203]
Areas for fitness	$280\ m^3 \leq v \leq 570\ m^3$	$t \leq 1.1$[203]
	$v \geq 570\ m^3$	$t \leq 1.8$[203]
	$v \leq 280\ m^3$	$t \leq 1.1$[203]
Areas for music rehearsal	$280\ m^3 \leq v \leq 570\ m^3$	$t \leq 1.4$[203]

Note:
Where room types include multiple use types (e.g., learning and fitness) use the limits that include the lower reverberation time or range.

Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PS04 MEET THRESHOLDS FOR IMPACT NOISE RATING | O (MAX: 1 PT)

Intent: Reduce impact noise between floors in a building to mitigate disrupted focus and sleep disturbances.

Summary: This feature requires projects to manage background noise levels by demonstrating compliance with impact noise mitigation techniques.

Issue: Sound can transmit between rooms within a building as structure-borne impact noise. This impact noise travels through structures (e.g., walls, floors, columns, piping) as vibrations that are then radiated as airborne noise to a listener.[208] Impact noise typically derives from objects impacting a floor (e.g., footfall, machinery, exercise equipment) and can result in workplace distractions, sleep disturbance or disrupted focus.[209,210]

Solutions: The overall construction of a building influences impact noise radiation levels. For example, a building that utilizes a light-weight floor construction (e.g., wood truss, cross-laminated timber, steel frame) generally exhibits higher degrees of impact noise radiation between floors.[211–214] Conversely, buildings constructed with resilient, composite floor-ceiling construction (e.g., thick concrete slab, suspended ceiling, floor with an underlayment) generally exhibit lower degrees of impact noise radiation.[215] The performance of floor-ceiling materials can be measured using the following metrics: Normalized Impact Sound Rating (NISR) or Weighted Standardized Impact Sound Pressure Level (LnTw).

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The following requirement is met:

a. For the following room types within the project boundary the floor-ceiling construction achieves the following Normalized Impact Sound Ratings (NISR), as measured by a professional in acoustics, in accordance with ASTM E1007-19, ISO 16283 or equivalent (LnTw may be used as an equivalent metric and may be determined by subtracting the NISR values listed below from 110):

Room Type	Location of Applicable Floor-Ceiling Assembly	Tier 1 1 point Minimum NISR[208]	Tier 2 2 points Minimum NISR[208]
Quiet zones (except areas for concentration)	Above	52	57
Areas for fitness	Below	47	52
Enclosed areas for concentration and conferencing	Above	47	52
Open areas for concentration	Above	42	47
Areas for retail and dining	Below	42	47

Note:
This requirement does not apply to floor/ceiling assemblies that separate a relevant room type from non-occupiable spaces (e.g., a quiet zone that is vertically adjacent to a roof, equipment room or attics). Note that the room vertically adjacent to the room type listed in the table may or may not be within the project boundary.

All projects are required to submit the WELL beta feature implementation feedback form for every WELL beta feature pursued during documentation review. More information on beta features can be found at https://resources.wellcertified.com/articles/introducing-well-beta-features/.

PS05 PROVIDE ENHANCED SPEECH INTELLIGIBILITY | O (MAX: 1 PT)

Intent: Improve speech intelligibility and accessibility by providing dedicated, high-performance audio technology.

Summary: This feature requires projects to implement organizational policies and provide occupants with devices that support enhanced speech intelligibility and bolster hearing accessibility in spaces intended for telecommunicating, instruction and public address.

Issue: The ability for people to comprehend speech is a fundamental consideration of universal design. Reduced or low speech intelligibility can negatively impact occupant satisfaction and well-being, especially for non-native speakers, individuals with hearing loss or neurodiverse populations.[169,170,199,201,216–220] Audio equipment used for communication can further decrease comprehension of spoken word when installed and used incorrectly.[168,216,219,221–223] Additionally, increased auditory workload can impact task performance, resulting in a higher risk of misunderstanding, operational errors and accidents.[224] In educational settings, increased vocal effort by teachers to overcome poor intelligibility has been linked to vocal strain, decreased job performance, lower quality of life, higher rates of leave or absence and resignation.[225–230]Improving speech intelligibility can support classroom participation for deaf and hard-of-hearing students, which is linked to improved scores for quality of life, social contact with peers and mental health.[231]

Solutions: Implementing audio systems can improve speech intelligibility for end-users in various environments. These systems include teleconferencing equipment in offices, speech reinforcement systems in classrooms and public address systems.[232,233] To provide the best possible outcomes for users, systems should be commissioned by a professional in audio engineering in order to meet diverse occupant needs and create more accessible spaces.[205,206,234]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The project meets the following requirements:

a. All rooms that are intended for conferencing, distance learning, or hybrid collaboration contain a combination of microphones, speakers, cameras and supportive audio components (e.g., amplifiers, digital signal processors) that are commissioned by a professional audio engineer.

b. All public address systems used on a daily basis meet the following:

   1. Commissioned by a professional audio engineer in accordance with NFPA 72 (Annex D), BS 5839 Part 8, ISO 7240 Parts 16 and 19 or equivalent.[235]
   2. Achieves a minimum STI 0.50 or CIS 0.75 in at least 50% of regularly occupied acoustically distinguishable spaces (ADS) when measured in accordance with IEC 60268-16 or equivalent.[236]

c. Speech reinforcement systems are installed in at least 80% of classrooms and all spaces for large presentation spaces (e.g., lecture hall, conference center) and meet the following: [237, 238]

   1. Designed to meet audio distribution requirements in accordance with ANSI/ASA S12.60 Part 1.
   2. Commissioned by a professional acoustician or audio engineer in accordance with ANSI/INFOCOMM A102.01:2017 or equivalent.

ENVIRONMENTAL MONITORING

Environmental Monitoring aims to encourage stakeholders to make data-driven decisions that help create and maintain healthy environments. Sharing air quality and thermal comfort information provides the opportunity to educate building users about factors affecting their health and well-being.

Many indoor environmental parameters are invisible and are often only noticed once they have reached levels detrimental to the health and wellness of occupants. Regularly monitoring the environment, either through period on-site testing or through continuous monitors, allows occupants and stakeholders to visualize what is often invisible and empowers stakeholders to proactively maintain healthy environments. Furthermore, educating occupants about the risks associated with elevated air pollutant exposures, along with actions they can take to reduce these risks, can encourage personal agency to seek out opportunities to further curb indoor pollution levels.

Achieving the goal of clean indoor air requires both professionals and building users to engage not just in the conversation but also in the implementation of adequate approaches. Although indoor air quality can be managed primarily through eliminating the sources of air pollution and through design solutions and human behavior modification,[5,9,10] monitoring is necessary to identify and fix any deviations in indoor quality metrics and minimize occupant exposure to pollutants.

Monitoring is also essential to assess the thermal environment. Thermal comfort greatly influences our experiences in the places where we live and work, and it is one of the highest contributing factors that influence overall human satisfaction in buildings, which impacts individual levels of motivation, alertness, focus and mood.[97,99,100,239] Its influence on the integumentary, endocrine and respiratory systems also allows thermal comfort to play a large role in our health, well-being and productivity.

Thermal comfort is subjective, which means that everyone may not equally comfortable under the same conditions. This highlights that a one-size-fits-all approach to thermal comfort in buildings invariably fails for large numbers of people.[108]A comfortable thermal environment that satisfies all occupants is challenging to achieve, due to individual preferences and possible spatial and temporal variations in the thermal environment.[109] Thermal comfort monitoring can help building users be aware of and promptly fix any deviations in thermal comfort metrics. These measures by themselves will not resolve the issue of potential thermal discomfort, but they certainly raise awareness and are an important first step toward a solution.

Assessment of drinking water quality is also vital to the well-being of building users. Over the last hundred years, many parts of the world saw dramatic improvements in drinking water quality that triggered massive reductions in the prevalence of infectious diseases. The U.S. Centers for Disease Control and Prevention recognize this as one of the ten greatest public health achievements of the 20th century.[58] However, there has been increasing risk from industrial, agricultural and pharmaceutical sources. Periodic water monitoring not only confirms the quality of the water, but it also helps determine the needs for maintenance in pipes, fixtures or treatment devices.

Environmental Monitoring features seek to implement evaluation strategies to ensure clean air, thermal comfort, and safe drinking water maximize benefits to productivity, well-being and health.

PM01 MEASURE AIR PARAMETERS | O (MAX: 1 PT)

Intent: Periodically assess indoor air quality issues for a better awareness of changes in air quality.

Summary: This WELL feature requires the on-going measurement of indoor air quality parameters.

Issue: Types and concentrations of indoor pollutants continuously fluctuate in any indoor or outdoor environment. For example, cooking in the home can lead to a rapid spike in indoor air pollution.[240] Urban rush hours and waste-burning cause spikes in air pollution outdoors, which can directly impact indoor air quality. Some indoor air pollutants are recognized by their immediate impacts on our body, such as throat irritation or watery eyes.[2,3] However others that go undetected, are not necessarily benign. According to the U.S. Environmental Protection Agency, some health impacts like respiratory diseases, heart disease and cancer can appear years after exposure.[241]

Solutions: Due to air quality fluctuations, it is important to periodically measure air quality in every building. Because air quality can fluctuate dynamically, monitoring is necessary to identify and fix any deviations in indoor quality metrics and minimize occupant exposure to pollutants.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces except Dwelling Units:

The following pollutants are monitored in occupiable spaces at intervals no longer than once per year, and the results are submitted annually through the WELL digital platform. To determine the required sample locations and quantity, refer to the WELL Performance Verification Guidebook.

a. $PM_{2.5}$.

b. PM_{10}.

c. One of the following:

  1. Total VOC.
  2. Benzene, Formaldehyde, Toluene.

d. Carbon monoxide.

e. Ozone.

Note:
Projects are not required to follow the device requirements or test methods described in the Performance Verification Guidebook.

PM02 INSTALL INDOOR AIR MONITORS | O (MAX: 1 PT)

Intent: Monitor indoor air quality issues for a better awareness of changes in air quality.

Summary: This WELL feature requires the ongoing measurement of contaminant data to empower building managers to proactively control their environmental quality.

Issue: Types and concentrations of indoor pollutants continuously fluctuate in any indoor or outdoor environment. For example, cooking in the home can lead to a rapid spike in indoor air pollution.[240] Urban rush hours and waste-burning cause spikes in air pollution outdoors, which can directly impact indoor air quality. Some indoor air pollutants are recognized by their immediate impacts on our body, such as throat irritation or watery eyes.[2,3] However, others that go undetected are not necessarily benign. According to the U.S. Environmental Protection Agency, some health impacts like respiratory diseases, heart disease and cancer can appear years after exposure.[241]

Solutions: Due to air quality fluctuations, it is important to install air quality sensors and detectors in every building. Because air quality can fluctuate throughout the day in every building, real-time monitoring is necessary to promptly fix any deviations in indoor quality metrics and minimize occupant exposure to pollutants. In addition to having robust and calibrated sensors, positioning them correctly plays a crucial role in the accurate assessment of air quality.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces except Dwelling Units & Guest Rooms:

The project deploys monitors with sensors that measure at least three of the following parameters in occupiable spaces in compliance with the requirements outlined in the Continuous Monitoring Protocols of the Performance Verification Guidebook:

a. $PM_{2.5}$ or PM_{10}.
b. Carbon dioxide.
c. Carbon monoxide.
d. Ozone.
e. Nitrogen dioxide.
f. Total VOCs.
g. Formaldehyde.

Note: Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

The following requirement is met:

a. Proof of calibration or replacement is submitted annually in accordance with the requirements of the WELL Performance Verification Guidebook.

For Dwelling Units & Guest Rooms:

The project deploys monitors with sensors that measure at least three of the following parameters in occupiable spaces in compliance with the requirements outlined in the Continuous Monitoring Protocols of the Performance Verification Guidebook:

a. $PM_{2.5}$ or PM_{10}.
b. Carbon dioxide.
c. Carbon monoxide.
d. Ozone.
e. Nitrogen dioxide.
f. Total VOCs.
g. Formaldehyde.

Note: Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PM03 PROMOTE AIR QUALITY AWARENESS | O (MAX: 1 PT)

Intent: Inform and educate individuals on the quality of the indoor environment.

Summary: This WELL feature requires sharing ongoing measurement of contaminant data with occupants to educate and empower them about their environmental quality.

Issue: Types and concentrations of indoor pollutants continuously fluctuate in any indoor or outdoor environment. However, these dynamics are not well understood by the general public since many pollutants are colorless and odorless, and therefore go unnoticed to occupants. While many pollutants may go undetected, they are not necessarily benign. According to the U.S. Environmental Protection Agency, some health impacts like respiratory diseases, heart disease and cancer can appear years after exposure.[241]

Solutions: Sharing air quality sensor data allows occupants to visualize what is often invisible. Furthermore, educating occupants about the risks associated with elevated air pollutant exposures, along with actions they can take to reduce these risks, can encourage personal agency to seek out opportunities to further curb indoor pollution levels.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The air quality data measured in Feature PM2 Install Indoor Air Monitors is made available to occupants as follows:

a. Data are presented through one of the following:
   1. Display screens prominently positioned at a height of 1.1–1.7 m with at least one display per 500 m^2 of regularly occupied space.
   2. Hosted on a website or phone application accessible to occupants. Signs are present indicating where the data may be accessed at a density of at least one sign per 500 m^2 of regularly occupied space.

b. Data presented include one of the following:
   1. Concentrations of the parameters measured.
   2. Qualitative results of air quality (e.g., colored-coded levels).

c. Data are updated at least once every 15 minutes.

Note:
This feature requires the achievement of PM2 Install Indoor Air Monitors.

PM04 MONITOR THERMAL ENVIRONMENT | O (MAX: 1 PT)

Intent: Monitor thermal comfort conditions and inform building managers and building users of the thermal comfort parameters of their indoor environment.

Summary: This WELL feature requires projects to monitor thermal comfort parameters using sensors that offer feedback for building managers and users to take appropriate actions.

Issue: Unfavorable levels of heat, humidity and ventilation are associated with itchy eyes, headache and throat irritation.[242] Outdoor weather, indoor occupancy and building physics and performance, including ventilation rates, are highly variable and have a direct impact on human perceptions of thermal comfort. To maintain ideal performance metrics, projects should continuously gather data on thermal comfort parameters to inform remediation actions.

Solutions: Building HVAC systems should be designed to monitor and control for variations in indoor air temperature, mean radiant temperature, relative humidity and air movement. Thermal comfort monitoring can help building users be aware of and promptly fix any deviations in thermal comfort metrics. These measures by themselves will not resolve the issue of potential thermal discomfort, but they certainly raise awareness and are an important first step toward a solution. In addition to having calibrated sensors, the positioning of the sensors plays an important role in the accurate assessment of the thermal environment.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The following requirements are met:

a. The project monitors dry-bulb temperature and relative humidity in occupiable spaces in compliance with the requirements outlined in the Continuous Monitoring Protocols of the Performance Verification Guidebook.

b. The thermal comfort data monitored is made available to occupants through one of the following:

   1. Display screens, with at least one screen located in each 500 m^2 zone of regularly occupied space.
   2. A website or mobile application, with at least one sign located in each 500 m^2 zone of regularly occupied space, indicating where the data may be accessed.

c. The thermal comfort data are updated at least once every 15 minutes.

Note: Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PM05 OPERABLE WINDOWS | O (MAX: 1 PT)

Intent: Increase the supply of high-quality outdoor air and promote a connection to the outdoor environment by encouraging building users to open windows when outdoor air quality is acceptable.

Summary: This WELL feature requires projects to provide operable windows and help occupants manage window-use through monitoring key environmental parameters.

Issue: The majority of ventilation standards specify ventilation rates and other measures intended to provide indoor air quality that is merely "acceptable" to building users and reduces the risk of adverse health effects.[44] Even with proper ventilation designed to meet ventilation standards, the concentration of indoor pollutants can exceed concentrations found in outdoor air.[45,46] Ventilation rates less than 10 L/s per person in all building types are associated with negative perceptions of air quality and actual health outcomes.[47]

Solutions: Scientific research suggests that an airflow rate significantly exceeding that which is recommended by standards is needed to minimize sick building syndrome symptoms and improve human performance and productivity.[40,48] Since it is difficult to test for every potential pollutant, and because carbon dioxide (CO_2) is easy to detect, CO_2 levels serve as a proxy for other indoor pollutants. A number of CO_2 studies suggest that the risk of sick building syndrome symptoms decreases significantly when CO_2 concentrations are less than 800 ppm.[47] One method for decreasing the CO_2 concentration experienced by occupants while minimizing additional energy use is demand-controlled ventilation, in which the delivery rate for outside air is directly linked to the measured CO_2 levels within the space.[243] Displacement ventilation improves indoor air quality by delivering fresh outdoor air at the floor level and thus leaving warmer polluted indoor air, such as CO_2 to be extracted above the height of the ventilation zone.[244]

Part 1 Provide Operable Windows (Max: 1 Pt)

For All Spaces:

Project meets one of the below:

a. At least 75% of the regularly occupied spaces have operable windows that provide access to outdoor air.

b. For each floor, the openable window area is at least 4% the area of the indoor occupiable space.[245]

Part 2 Manage Window Use (Max: 0 Pt)

For All Spaces:

The following requirement is met:

a. Outdoor levels of $PM_{2.5}$, temperature and humidity are monitored at intervals of at least once per hour, based on a data-gathering station located within 4 km of the building. This monitoring system may be operated by the project or by another entity (e.g., a government).

Indicator lights and/or digital displays at windows (at least one per room with windows) cue occupants when conditions outside are suitable for opening windows:

a. $PM_{2.5}$: 15 μg/m^3 or lower.

b. Dry-bulb temperature: within 8 °C of indoor air temperature setpoint.

c. Relative Humidity: 65% or lower.

PM06 ASSESS AND MAINTAIN DRINKING WATER QUALITY | O (MAX: 1 PT)

Intent: Maintain consistently high-quality drinking water by monitoring key water quality parameters on a more frequent interval.

Summary: This feature requires projects to test water quality parameters on a quarterly interval to determine treatment needs.

Issue: Providing potable water to buildings is a multi-stage process that involves sourcing the water, potabilization in treatment plants, distribution through a network of pipes and delivery to the tap. While steady delivery of potable water is a reality in many places, other places must regularly contend with water that is delivered below potability standards or with fluctuating quality due to: the intrusion of contaminants in the water distribution pipes,[64] unsupervised changes in municipal water supply and treatment or weather-related events.[246]

Solutions: From a building perspective, sound water quality management begins with an understanding of the incoming water quality, preferably through testing and analysis of historical data. If needed, treatment devices, such as filters or UV disinfection units, can be used to achieve data-driven, health-based water quality targets.[59] Periodic water monitoring not only confirms the quality of the water, it also helps determine the needs for maintenance in pipes, fixtures or treatment devices.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The following requirements are met:

a. Piped water is delivered to drinking water dispensers.

b. Water is tested quarterly in drinking water dispensers and meets the following thresholds. If any sample is found beyond these thresholds, remediation and re-testing occurs within a month:

   1. Turbidity is 1.0 NTU, FTU or FNU or less.
   2. pH is between 6.5 and 9 (between 5.5 and 9 if a reverse osmosis system is installed at the point of use).
   3. Total Dissolved Solids (TDS) are 500 mg/L or less.
   4. Total Chlorine is 5 mg/L or less.
   5. Residual (free) Chlorine is 5 mg/L or less.
   6. Total Coliforms are not detected in a 100 ml sample. Testing is required only if residual chlorine is not detected.
   7. Lead is 10 mg/L or less. Sampling frequency can be reduced to once per year if results are below detection limits in two consecutive samples.
   8. Copper is 2 mg/L or less. Sampling frequency can be reduced to twice a year if results are below 0.1 mg/L in two consecutive samples; testing is no longer required if four consecutive samples are below this threshold.

c. The number and location of sampling points for on-going monitoring complies with the requirements outlined in the Performance Verification Guidebook. For pH, use sampling locations and frequency set for residual chlorine.

d. All test results are submitted annually through the WELL digital platform.

OCCUPANT EXPERIENCE

Occupant Experience aims to quantify occupant metrics across a variety of parameters—including satisfaction and self-reported well-being measures—and determine how building performance can impact the occupant experience.

Surveys are an established tool for understanding and evaluating people's perceptions of indoor environmental conditions, wellness policies and personal well-being.[100,247,248] Psychometrically validated surveys and questions ensure that sensitive questions are framed appropriately, measure what they are intended to measure, and--when combined with environmental satisfaction questions--effectively capture high-quality data.[249–252] Employees who perceive that their employer acts on their feedback are four times more likely to stay with their company; moreover, investing in the employee experience can reduce turnover and absenteeism and increase productivity, retention and engagement.[253,254] Surveys that ask building users about their satisfaction with indoor environmental quality and workplace wellness amenities and policies help evaluate the effectiveness of existing health and wellness interventions, identify opportunities to create a healthier environment and bring employers significant returns on investment.[252,254–256]

Within every built space there exists a unique community of people with diverse characteristics who are linked by social ties, share common perspectives and engage in joint action and experiences in shared settings or locations.[257] Due to how differently built spaces are designed and operated, and considering the diversity of occupants in a given space, many environments are not designed for diverse health needs or abilities.[258,259,260,261,262,263] Projects that do not consult stakeholders during the planning process or neglect to gather their feedback after occupancy often fail to holistically serve stakeholder needs.[264,265]

Thermal comfort surveys allow projects to objectively gauge which building services and design features are--or are not--performing well and help prioritize the steps needed to improve occupant thermal comfort satisfaction and workplace productivity. Studies have also shown that only 11% of office buildings surveyed in the U.S. provide thermal environments that meet generally accepted goals of human satisfaction.[106] Similarly, as many as 41% of office workers have expressed dissatisfaction with the thermal environment.[100,106] Building users who are satisfied with their thermal environment have been shown to be more productive in the workplace,[106] while thermal discomfort is associated with sick building syndrome symptoms and other conditions that lead to a decrease in productivity.[106,266]

Occupant Experience features capture invaluable occupant feedback, empowering stakeholders with the information needed to identify priority interventions and take action to create healthier and more productive spaces.[256]

PX01 OCCUPANT SURVEY | O (MAX: 1 PT)

Intent: Evaluate the experience and self-reported comfort and well-being of building users through occupant surveys.

Summary: This feature requires projects to collect feedback from building users through third-party or custom surveys on their health, well-being and satisfaction with their environment.

Issue: Given the wide diversity in the design, operation and use of built spaces, it is difficult to gauge which design, policy and programmatic approaches will benefit the health and well-being of the most individuals in a space.[258,259] For example, decision-makers and users of the space often experience things differently.[258] Employers do not often put methods in place to systematically gather input on the experience of their employees, such as satisfaction with policies, design and maintenance or feelings of overall health.[253,254,267]

Solutions: Surveys are an established tool for understanding and evaluating people's perceptions of indoor environmental conditions, wellness policies and personal health and well-being.[100,247,248] Psychometrically validated surveys and questions ensure that sensitive questions are framed appropriately, measure what they are intended to measure, and--when combined with environmental satisfaction questions--effectively capture high-quality data.[249–252] Employees who perceive that their employer acts on their feedback are four times more likely to stay with their company; moreover, investing in the employee experience can reduce turnover and absenteeism and increase productivity, retention and engagement.[253,254]Surveys that ask building users about their satisfaction with indoor environmental quality and workplace wellness amenities and policies help evaluate the effectiveness of existing health and wellness interventions, identify opportunities to create a healthier environment and bring employers significant returns on investment.[252,254–256]

Part 1 Select Project Survey (Max: 1 Pt)

For All Spaces:

For projects with ten or more eligible employees, the following requirement is met:

a. A survey is selected from a survey provider listed on Reference.

OR

For projects with ten or more eligible employees, the following requirement is met:

a. A survey is created that covers the topics listed in Reference.

Part 2 Administer Survey and Report Results (Max: 0 Pt)

For All Spaces:

The following requirements are met:

a. All eligible employees are invited to participate in the survey annually. Regular reminders are sent to eligible employees to complete the survey.

b. Survey protects all participant-identifying data through appropriate measures such as anonymous reporting and safe data storage. Any communication of results should be on an aggregated basis, such that no participant can be identified.

c. Analysis of responses is conducted by a qualified survey professional.

The project or organization annually submits, through the platform, the following:

a. Project and survey data, including:
   1. Total number of employees invited to complete the survey and number of employees who completed the survey.
   2. Date survey started and finished.
   3. Project location.
   4. Project type.
   5. Level of WELL achievement, if applicable (e.g., WELL Certified at the Gold level under WELL v2, WELL Health-Safety Rated).

b. Aggregated, anonymized survey results.

PX02 UTILIZE ENHANCED SURVEY | O (MAX: 1 PT)

Intent: Build on minimum occupant survey requirements with enhanced and customized questions to comprehensively evaluate self-reported comfort and well-being of building users.

Summary: This feature requires projects to build on minimum occupant survey requirements by collecting and responding to more in-depth and customized information from building users on their well-being and satisfaction with their environment.

Issue: Given the wide diversity in the design, operation and use of built spaces, it's difficult to gauge which design, policy and programmatic approaches will benefit the health and well-being of the most individuals in a space.[258,259] For example, decision-makers and users of the space often experience things differently.[258] Employers do not often put methods in place to systematically gather input on the experience of their employee, such as satisfaction with policies, design and maintenance or overall health.[253,254,267]

Solutions: Occupancy surveys measure the extent to which a building promotes user health and comfort.[100,247,248,268–270] Specifically, psychometrically validated surveys evaluate building users' experience, frame sensitive questions appropriately and measure what they are intended to measure.[249,250] Incorporating a range of survey topics provides a comprehensive picture of which interventions impact building users' satisfaction.[269,271,272] Stakeholders can use results to identify priority interventions to make spaces healthier and more productive.[256] Offering the opportunity to provide feedback can improve employee morale and retention while creating a healthier environment for all.[254,273,274,275–278]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

For projects with ten or more eligible employees, the following requirements are met:

a. Meet Feature PX1 Occupant Survey using a third-party or pre-approved survey provider.

b. Address at least one of the topics listed in Reference through a minimum of three additional survey questions utilizing a pre-approved survey provider listed on Reference.

The project or organization meets the following requirements:

a. Based on survey results, investigate correlations, inferential statistics (such as multivariate analysis), or other analyses beyond descriptive statistics.

b. Submit the following through the platform annually:

1. Aggregated, anonymized survey results for the additional topics selected.
2. Results of enhanced analysis.

PX03 UTILIZE PRE- AND POST-OCCUPANCY SURVEY | O (MAX: 1 PT)

Intent: Explore differences in occupant experience before and after the project's pursuit of WELL.

Summary: This feature requires projects to build on minimum occupant survey requirements by collecting and responding to information from building users on their health, well-being and satisfaction with their environment both before and during occupancy.

Issue: Given the wide diversity in the design, operation and use of built spaces, it's difficult to gauge which design, policy and programmatic approaches will benefit the health and well-being of the most individuals in a space.[258,259] For example, decision-makers and users of the space often experience things differently.[258] Employers do not often put methods in place to systematically gather input on the experience of their employee, such as satisfaction with policies, design and maintenance or overall health.[253,254,267]

Solutions: Occupancy surveys measure the extent to which a building promotes user health and comfort.[100,247,248,268–270]Incorporating a range of survey topics, and utilizing both pre- and post-occupancy surveys, provides a comprehensive picture of which interventions impact building users' satisfaction.[269,271,272] Offering the opportunity to provide feedback can improve employee morale and retention while also creating a healthier environment for all.[254,273,274,275–278]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

For projects with ten or more eligible employees, the following requirement is met:

a. Prior to achieving a WELL milestone, administer a survey for eligible employees using the same Reference that will be used for Feature PX1.

The project or organization meets the following requirements:

a. Compare results from the baseline survey against subsequent survey results.

b. Submit aggregated, anonymized survey results through the WELL platform on the following:

1. Aggregated, anonymized results of the baseline survey.
2. Comparison between the results of the baseline and annual surveys.
3. Total number of employees invited to complete the survey and number of employees who completed the survey.
4. Date each survey started and finished.
5. Location where each survey was administered.
6. Project type.
7. Level of WELL achievement, if applicable.
8. Sociodemographic information (age and gender at minimum).

Note:
Projects do not need to administer additional pre-occupancy surveys at recertification/renewal.

PX04 FACILITATE INTERVIEWS, FOCUS GROUPS AND/OR OBSERVATION | O (MAX: 1 PT)

Intent: Build on occupant survey requirements with in-person assessment methods to evaluate the experience and self-reported health and well-being of building users.

Summary: This feature requires projects to conduct interviews, focus groups and/or observations in order to collect and respond to more in-depth and customized information from building users on their health, well-being and satisfaction with their environment.

Issue: Given the wide diversity in the design, operation and use of built spaces, it's difficult to gauge which design, policy and programmatic approaches will benefit the health and well-being of the most individuals in a space.[258,259] For example, decision-makers and users of the space often experience things differently.[258] Employers do not often put methods in place to systematically gather input on the experience of their employee, such as satisfaction with policies, design and maintenance or overall health.[253,254,267]

Solutions: Interviews and focus groups provide key insights not captured in surveys.[279–281] Stakeholders can use results to identify priority interventions to make spaces healthier and more productive.[256] Offering the opportunity to provide feedback can improve employee morale and retention while creating a healthier environment for all.[254,273,274,275–278]

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The project or organization annually conducts "evaluations" (defined here as stakeholder interviews, focus groups and/or observations) that meet the following requirements:

a. Are conducted and analyzed by a professional experienced in qualitative research.
b. Comprise a culturally representative sample of the population.
c. Discuss the impact that the built environment and organizational initiatives have on occupant health and well-being.
d. Protect participant privacy and identity.

The project or organization meets the following requirements:

a. Compare results from the interviews, focus groups and/or observations to other survey results, as applicable.
b. Annually submit aggregated, anonymized results of interviews, focus groups and/or observations through the platform on the following:
    1. Comparison between the results of the interviews, focus groups and/or observations and the survey results, as applicable.
    2. Total number of employees and number of employees who participated in the interviews, focus groups and/or observations.
    3. Date the interviews, focus groups and/or observations started and finished.
    4. Project location.
    5. Project type.
    6. Level of WELL achievement, if applicable.
    7. Sociodemographic information of participants (age and gender at minimum).

PX05 SURVEY FOR THERMAL COMFORT | O (MAX: 2 PT)

Intent: Enhance thermal comfort and promote human productivity by confirming that a substantial majority of building users perceive their environment as thermally acceptable.

Summary: This WELL feature requires projects to provide high levels of thermal comfort, as determined by occupant satisfaction through a survey.

Issue: Due to the strong influence of the thermal comfort, standards establish that building's thermal environment must satisfy a minimum of 80% of occupants to be considered acceptable.[103] However, despite having established standards, studies have also shown that only 11% of office buildings surveyed in the U.S. provide thermal environments that meet generally accepted goals of human satisfaction.[106] Similarly, as many as 41% of office workers have expressed dissatisfaction with their thermal environment.[100,106] Building users who are satisfied with their thermal environment have been shown to be more productive in the workplace,[106] while thermal discomfort is associated with sick building syndrome symptoms and other conditions that lead to a decrease in productivity.[106,266]

Solutions: Building occupants are an invaluable source of information that can be used for improving the performance of buildings. Thermal comfort surveys allow projects to objectively gauge which building services and design features are--or are not--performing well and help prioritize the steps needed to improve occupant thermal comfort satisfaction and workplace productivity. If survey results indicate that the percentage of occupants dissatisfied with thermal conditions in the building exceeds the targeted thresholds, it is necessary to develop a detailed plan of action and commitment to address occupant dissatisfaction with thermal conditions.

Part 1 Part 1 (Max: 2 Pt)

For All Spaces:

A post-occupancy survey is administered at least twice a year, including once in June, July or August and once in December, January or February. For buildings located in tropical regions, the survey may be administered twice a year, at least four months apart. Survey is administered at least six months after occupancy, which satisfies the following conditions:

a. All regular occupants are invited to participate in the anonymous survey, and responses are collected from the following number of respondents:[96]

Number of regular occupants	Minimum number of responses
More than 45	35% of those regular occupants
20 to 45	15 regular occupants
Less than 20	80% of those regular occupants

b. The survey includes an assessment of overall satisfaction with thermal performance and identifies thermal comfort-related issues in accordance with either:

1. The sample survey in Reference.
2. Any survey from the "Features C04 and C05: Approved third-party surveys" section on IWBI's website(Reference).

c. The results of the survey responses comply with one of the target satisfaction thresholds, as specified in the table below:

Tier	Thermal Comfort Satisfaction Thresholds	Point Value
1	80% of regular occupants	1 point
2	90% of regular occupants	2 points

APPENDIX C1:

The following topics must be covered by the custom survey selected for Option 2: Custom Survey in Feature C04 Part 1:

1. General building and occupancy information, including job type or time spent in the building.
2. Indoor environmental quality of air, water, light, sound and thermal comfort.
3. Ergonomics, layout and aesthetics.
4. Maintenance and cleanliness.
5. Amenities: access to nature, views and nourishment options.
6. Satisfaction with how policies and amenities impact and support healthy behaviors (e.g., physical activity, healthy eating).
7. Access to and engagement with workplace wellness initiatives or offerings (e.g., physical activity incentive programs, health benefits and services).
8. Employee support policies (e.g., paid parental and family leave, flexible working arrangements).
9. Productivity and engagement (e.g., through measures of hours worked or motivation).
10. Self-rated health and well-being.
11. Standard sociodemographic information (age and gender at minimum).

APPENDIX C2:

Approved additional topics to add to the pre-approved survey in Part 1: Select Enhanced Survey in Feature C05: Enhanced Occupant Survey.

Category	Topic
	Mode of transportation to and from work and distance or time traveled
	Hydration
	Sleep satisfaction, quality and/or quantity
Healthy Behaviors:	Physical activity
	Alcohol consumption
	Healthy eating
	Ability to take restorative breaks
	Smoking habits
	Sick building syndrome
	Mental health
Enhanced Health and Well-being:	Social, cultural or economic well-being
	Musculoskeletal issues (e.g., back, neck pain)
	Health literacy
	Assessment of individual work style, patterns, processes, space utilization and ability to focus or collaborate
Performance and Resilience:	Workplace performance
	Engagement
	Workload, stress, burnout and/or employee resilience
	Creative thinking
	Safety and security, including for diverse population groups (e.g., cultural, ethnic, gender, ability, age)
Policies and Culture:	Emergency preparedness (e.g., pandemic, fire, natural disaster)
	Workplace wellness programs and perceived effectiveness
	Leadership investment in employee health and perceived effectiveness
	Social equity programs and perceived effectiveness
	Comparison to previous space
Other:	Values related to, level of access to and experience of nature
	Feedback on specific design interventions
	Healthy behaviors, ergonomics, mental health and productivity for remote workers
	Additional sociodemographic information (e.g., education, ethnicity, income)

INNOVATION

Innovation features address a novel concept or strategy aimed at measuring building performance in ways that are not already included within existing WELL Performance Rating features.

The Innovation features provides guidelines on the requirements that must be met for an Innovation to be considered for approval. Projects should use Option 1 to submit Innovation proposals. Options II-IV represent additional Innovation strategies pre-approved by IWBI.

PI01 INNOVATION I | O (MAX: 1 PT)

Intent: Promote excellence in project design and continuous evolution of the WELL Performance Rating.

Summary: This feature provides projects several options to go beyond features of the WELL Performance rating, including a pathway to propose new interventions that address health and well-being in novel ways and achieve relevant design-based features from the WELL Building Standard.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The project implements a performance monitoring strategy, either through sensor hardware or other measured metrics, that meets the following requirements:

a. Measures a parameter not included in the WELL Performance Rating.

b. Positively impacts project occupants by supporting health and well-being.

OR

At least one member of the project team:

a. Has achieved the WELL AP credential.

b. Maintains accreditation until the project's initial rating is achieved.

OR

One of the following requirements are met:

a. The project is WELL Precertified. This strategy may be used for one Innovation feature.

b. The project has achieved a WELL Rating. This strategy may be used for one Innovation feature.

c. The project is WELL Certified. This strategy may be used for three Innovation features.

PI02 INNOVATION II | O (MAX: 1 PT)

Intent: Promote excellence in project design and continuous evolution of the WELL Performance Rating.

Summary: This feature provides projects several options to go beyond features of the WELL Performance rating, including a pathway to propose new interventions that address health and well-being in novel ways and achieve relevant design-based features from the WELL Building Standard.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The project implements a performance monitoring strategy, either through sensor hardware or other measured metrics, that meets the following requirements:

a. Measures a parameter not included in the WELL Performance Rating.

b. Positively impacts project occupants by supporting health and well-being.

OR

At least one member of the project team:

a. Has achieved the WELL AP credential.

b. Maintains accreditation until the project’s initial rating is achieved.

OR

One of the following requirements are met:

a. The project is WELL Precertified. This strategy may be used for one Innovation feature.

b. The project has achieved a WELL Rating. This strategy may be used for one Innovation feature.

c. The project is WELL Certified. This strategy may be used for three Innovation features.

PI03 INNOVATION III | O (MAX: 1 PT)

Intent: Promote excellence in project design and continuous evolution of the WELL Performance Rating.

Summary: This feature provides projects several options to go beyond features of the WELL Performance rating, including a pathway to propose new interventions that address health and well-being in novel ways and achieve relevant design-based features from the WELL Building Standard.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The project implements a performance monitoring strategy, either through sensor hardware or other measured metrics, that meets the following requirements:

a. Measures a parameter not included in the WELL Performance Rating.

b. Positively impacts project occupants by supporting health and well-being.

OR

At least one member of the project team:

a. Has achieved the WELL AP credential.

b. Maintains accreditation until the project's initial rating is achieved.

OR

One of the following requirements are met:

a. The project is WELL Precertified. This strategy may be used for one Innovation feature.

b. The project has achieved a WELL Rating. This strategy may be used for one Innovation feature.

c. The project is WELL Certified. This strategy may be used for three Innovation features.

PI04 INNOVATION IV | O (MAX: 1 PT)

Intent: Promote excellence in project design and continuous evolution of the WELL Performance Rating.

Summary: This feature provides projects several options to go beyond features of the WELL Performance rating, including a pathway to propose new interventions that address health and well-being in novel ways and achieve relevant design-based features from the WELL Building Standard.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The project implements a performance monitoring strategy, either through sensor hardware or other measured metrics, that meets the following requirements:

a. Measures a parameter not included in the WELL Performance Rating.

b. Positively impacts project occupants by supporting health and well-being.

OR

At least one member of the project team:

a. Has achieved the WELL AP credential.
b. Maintains accreditation until the project's initial rating is achieved.

OR

One of the following requirements are met:

a. The project is WELL Precertified. This strategy may be used for one Innovation feature.
b. The project has achieved a WELL Rating. This strategy may be used for one Innovation feature.
c. The project is WELL Certified. This strategy may be used for three Innovation features.

PI05 INNOVATION V | O (MAX: 1 PT)

Intent: Promote excellence in project design and continuous evolution of the WELL Performance Rating.

Summary: This feature provides projects several options to go beyond features of the WELL Performance rating, including a pathway to propose new interventions that address health and well-being in novel ways and achieve relevant design-based features from the WELL Building Standard.

Part 1 Part 1 (Max: 1 Pt)

For All Spaces:

The project implements a performance monitoring strategy, either through sensor hardware or other measured metrics, that meets the following requirements:

a. Measures a parameter not included in the WELL Performance Rating.

b. Positively impacts project occupants by supporting health and well-being.

OR

At least one member of the project team:

a. Has achieved the WELL AP credential.

b. Maintains accreditation until the project's initial rating is achieved.

OR

One of the following requirements are met:

a. The project is WELL Precertified. This strategy may be used for one Innovation feature.

b. The project has achieved a WELL Rating. This strategy may be used for one Innovation feature.

c. The project is WELL Certified. This strategy may be used for three Innovation features.