WELL v2™

DYNAMIC. RESILIENT. VALIDATED.

The next version of the
WELL Building Standard™



INTERNATIONAL
WELL
BUILDING
INSTITUTE™

WELL V2, Q2 2025

INTRODUCTION

Dynamic. Resilient. Validated

WELL v2 has graduated

The WELL Building Standard™ version 2 (WELL v2™) is a vehicle for buildings and organizations to deliver more thoughtful and intentional spaces that enhance human health and well-being. WELL v2 includes a set of strategies—backed by the latest scientific research—that aim to advance human health through design interventions and operational protocols and policies and foster a culture of health and well-being. Built upon the pioneering foundation of the first version of the WELL Building Standard (WELL v1), WELL v2 draws expertise from a diverse community of WELL users, practitioners, public health professionals and building scientists around the world.

HOW DID WE GET HERE?

The role buildings can play in human health and well-being has never been more evident or more important. Thanks to an evolving evidence base, we understand more about the relationship between the physical environment and human health than ever before. We know how to create spaces that enhance – rather than hinder – health and well-being. We can measure – and then improve – the quality of our air, water and light. We can design environments that fuel our bodies, move us, keep us connected, inspire our best work and facilitate a good night's sleep.

With WELL as our vehicle, IWBI helps to translate what we know into what we practice. We aspire to transform buildings and organizations in ways that advance health and well-being to help people thrive. This has been our mission since we launched WELL in 2014. And today, we know much more about how to achieve our goals. We've channeled all that we have learned into a more accessible, adaptable and equitable rating system, which continues to be anchored by the latest scientific research and industry best practices and serves as the foundation upon which the entire WELL ecosystem is built.

Since the launch of the WELL v2 pilot in 2018, we've worked tirelessly to incorporate feedback from thousands of members of our global community. During the two-year pilot phase, WELL v2 underwent improvement and refinement through a rigorous process, including a six-month public comment period and a final stakeholder review, garnering hundreds of market insights across the two phases. Throughout the pilot, we also published quarterly addenda to clarify and streamline implementation for projects around the world. In addition, the IWBI Task Force on COVID-19, comprised of 16 co-chairs and nearly 600 leaders and experts from 30 countries, collectively crowdsourced hundreds of comments during a 40-day sprint to assess how WELL v2 could be further strengthened to better support prevention and preparedness, resiliency and recovery.

The evolution of WELL v2 was supported by more than 150 WELL concept advisors. Concept advisors have expertise in one or more of the ten WELL concepts and provide input on solutions to health and well-being concerns, best practices for localization, case studies to fill research gaps and innovative topic areas. Their expertise and input supported IWBI's Standard Development team, comprised of experts in each of the ten WELL concepts, at every turn, and helped take WELL to new heights.

In 2020, IWBI formed our Governance Council comprised of key global thought leaders, doctors, public health professionals and business executives. The IWBI Governance Council is tasked with a dual purpose to uphold the integrity of the WELL Building Standard development process and accelerate market transformation at a global scale. The first task of the Governance Council was to vote to confirm that WELL v2 met defined best practices for standard development and that each WELL feature met four tenets:

1. Evidence-based. Each WELL feature is underscored by available evidence that links design, policy and built environment strategies to health and well-being outcomes. Features are substantiated by a diverse and rigorous evidence-base, including peer-reviewed literature; academic research; and leading design standards, laws, codes and best practices.
2. Verifiable. All WELL features are third-party verified by GBCI through documentation and/or performance testing.
3. Implementable. All WELL v2 features haves been tested through WELL v1 and/or WELL v2 pilot demonstrating adoption and uptake by projects across the world.
4. Presented for outside input. At every step of the way, IWBI gathered feedback from a diverse community of practitioners, subject matter experts, users and other third parties to inform the development and evolution of WELL.

When put to the vote, in June 2020, the esteemed members of the IWBI Governance Council ***unanimously*** agreed that every

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

single feature in WELL v2 meets the tenets outlined above. Following this rigorous review process leveraging internationally recognized standard development best practices, WELL v2 has demonstrated it is resilient, verified and dynamic.

PRINCIPLES OF WELL V2

This latest version of WELL has proven itself to be a scalable and globally applicable feature set that's responsive, inclusive and adaptable to fit any environment or organization seeking to elevate human health and promote well-being for all.

WELL v2 is founded on the following principles:

Equitable: Aims to benefit a variety of people, including and especially disadvantaged or vulnerable populations.

Global: Proposes interventions that are feasible, achievable and relevant across many applications throughout the world.

Evidence-based: Draws upon a diverse and rigorous body of research across varying disciplines, validated by a collaborative body of experts, including IWBI advisors.

Technically robust: Defines industry best practice and validates strategies through performance verification and a rigorous third-party verification process.

Customer-focused: Sponsors the success of WELL users through dedicated coaching services, dynamic resources and an intuitive platform for navigating the journey.

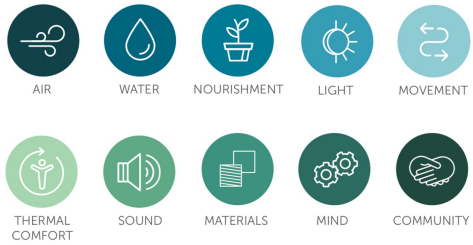
Resilient: Keeps pace with advances in research, science, technology and society, continuously improving by integrating new findings.

ARCHITECTURE OF THE RATING SYSTEM

WELL v2 consolidates previous iterations and pilots into a single rating system that is designed to accommodate all project types and sectors. The system is intended to grow in specificity and specialty over time, adapting to accommodate diverse project types and geographies and in response to new evidence and ever-evolving public health imperatives.

TEN CONCEPTS

There are ten concepts in WELL v2:



Each concept consists of features with distinct health intents. Features are either preconditions or optimizations.

UNIVERSAL PRECONDITIONS

Preconditions define the fundamental components of a WELL Certified space and serve as the foundation of a healthy building. WELL v2 offers a universal set of preconditions for all projects.

All preconditions – including all parts within them – are mandatory for certification.

FLEXIBLE OPTIMIZATIONS WITH MEANINGFUL WEIGHTINGS

Optimizations are optional pathways for projects to meet certification requirements in WELL. Project teams may select which optimizations to pursue and which parts to focus on within each optimization.

WELL v2 operates on a points-based system, with 110 points available in each project scorecard. All optimizations are weighted with varying point values. The maximum point value of a feature is determined by the sum of its parts. A part is weighted by its potential for impact, defined as the extent to which a feature addresses a specific health and well-being concern or opportunity for health promotion, and the potential impact of the intervention.

Note: for some optimizations, achieving points in one part is contingent upon achieving points in another part.

DYNAMIC SCORECARD

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

The WELL digital platform guides project teams through the development of a unique scorecard. The digital platform recommends a selection of features based on project-specific parameters that can be further defined and refined by the project team.

PERFORMANCE VERIFIED FEATURES

WELL is a performance-based system. Every WELL project is verified through on-site testing of building performance. This practice is fundamental to high-performing buildings and helps project teams better understand the relationship between the physical environment and human health.

The process for on-site assessments and testing is called Performance Verification. On-site measurements are taken for various air and water quality parameters, as well as sound and light levels. It is a distinct process from traditional building commissioning and assures that the building performs as intended, according to WELL requirements.

Performance Verification is completed by an authorized WELL Performance Testing Agent, who usually spend one to three days in the building to validate the project's documentation and complete a series of performance tests, spot-checks and measurements covering all WELL concepts. Testing is completed according to IWBI's sampling protocols available in the WELL Performance Verification Guidebook.

PROJECT TYPES

WELL v2 projects fall into one of two main groups, determined primarily by ownership type:

- Owner-occupied: The project is mainly occupied by the project owner (which may be different than the building owner).
- WELL Core: The project owner occupies a small portion of the project area and rents/leases most of the space to one or more tenants.

Owner-occupied Projects

Owner-occupied projects are owned or leased by the project owner, and regular occupants (e.g., employees) are affiliated with the project owner. Owner-occupied projects are awarded WELL Certification at the Bronze, Silver, Gold or Platinum level (see Scoring and Certification Levels below).

Interiors represent a particular case of owner-occupied projects, where the project owner rents/leases space within a larger building (the "base building") that is less than half the size of the base building. Interiors projects operate like other owner-occupied projects, but in some cases, they can receive credit for amenities within the base building (see Project Boundary below). In other instances, interiors projects may be required to collaborate or work with the building owner or landlord to meet feature requirements that apply to building systems or spaces outside of the project owner's control, such as the HVAC system.

WELL Core Projects

WELL Core is a distinct pathway for core and shell buildings (also known as base buildings) seeking to implement fundamental features to benefit tenants. In these projects, the majority of regular occupants are not affiliated with the project owner. Any building type can register for WELL Core, provided that at least 75% of the project area is occupied by one or more tenants and/or serves as common space in the building accessible to all tenants. Note that offices affiliated with the project owner but unrelated to the management of the project property may be considered a tenant, as long as additional tenants unaffiliated with the project owner occupy at least 60% of the net leased area. WELL Core projects are awarded WELL Core Certification at the Bronze, Silver, Gold or Platinum level (see Scoring and Certification Levels, below)

Mixed-use buildings where WELL Core is appropriate for at least 60% of the project area may register the entire building for WELL Core. Areas operated/occupied by the project owner are considered "non-leased space" (see Scope and Applicability below). Non-leased spaces include the common areas of the building and private spaces directly under the control of the building management team. Mixed-use buildings where WELL Core is appropriate for less than 60% of the project area should register one or more portions of the building as individual projects for WELL Certification or WELL Core Certification, as appropriate.

Feature Applicability and Scoring

Features have varying scopes of applicability for WELL Core projects, depending on the relevant population and project area. For example, some features, such as daylighting (L05) or bicycle storage (V04), must be met across the entire building. Other features apply only to spaces or personnel under the purview of the project owner, such as offering healthcare (C06) or childcare (C10) benefits.

Applicability designations are defined as follows:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

- **Building Management Staff**: Individuals responsible for maintaining and operating the building, including contractors and sub-contractors. Workers who spend less than 30 hours per month in the building (i.e., who are not regular occupants) are not considered building management staff.
- **Direct Staff:** Building staff under direct employment by the project owner. Note: If a project has no direct staff on-site (i.e., the building is entirely operated by contracted building management staff), the project is allowed to earn points by meeting feature requirements for all or a defined subset of building management staff. Projects must use a single consistent population across all features, including preconditions (e.g., a project with no direct staff may only earn a point for meeting an optimization for its building management staff, if it also meets all preconditions for that same group of people).
- **Extent of Developer Buildout**: Includes all non-leased space and all construction within the leased space for which the project team is responsible.
- **Leased Spaces**: All areas within the project boundary that are leased to or owned by tenants, including areas for lease or for sale that are not currently occupied.
- **Non-leased Spaces**: All areas within the project boundary that are not considered leased space.
- **Project owner:** The legal entity that controls the property through ownership or as a leasee.
- **Whole Building**: Includes all areas within the project boundary. Some features indicate that projects can achieve a feature by providing a tenant budget. To use this pathway, project teams need to submit as part of documentation review, design assumptions and sample cut-sheets (as applicable) that justify the budget and can be used by the tenant during their design and construction process.

WELL Core projects have different point-values for parts and features than owner-occupied projects, based on the extent to which the requirements benefit all occupants within the project. Features that must be met for the whole building are generally worth more for WELL Core, while features with no or limited effect on tenants are generally reduced in value.

Some features allow WELL Core projects to earn additional points for applying the feature requirements in leased spaces (tenant areas) in addition to non-leased spaces. In addition, for projects where non-leased space makes up 40% or more of the project area, the additional point for some features (if indicated in the Core notes) may be earned without extending requirements to non-leased space. Projects are only eligible for one additional point per feature. Further guidance on applicability and additional point-earning potential for WELL Core is provided in the digital standard. To view this guidance, be sure to select the "WELL Core" view in the digital standard.

To earn additional points, WELL Core projects should first meet the baseline requirements of the feature established in WELL Core guidance. The exception is projects that do not include direct staff and/or non-leased space within their scope; these projects may earn both the base points and additional points by meeting the requirements outlined in the additional point opportunity. To activate in their scorecard, projects will select the base point and the additional point from the dropdown menu.

Performance Testing Scope

For WELL Core projects, at least 2.5% of the total building floor area must be available for performance testing for certain preconditions. The available testing area must include all common areas and spaces directly under the control of the building management team. If common areas and spaces under owner control comprise less than 2.5% of the total building floor area, the project must supplement with tenant spaces to reach this threshold. Testing in leased spaces in these cases can take place before or after tenant occupancy.

Some performance-based optimizations explicitly state that they require testing in tenant spaces to be awarded. The project is responsible for identifying and communicating to Green Business Certification, Inc. (GBCI) and the WELL Performance Testing Agent the particular spaces which are available for testing.

Multifamily Residential Projects

Multifamily residential projects may pursue WELL if they contain at least five dwelling units in a single building with common structural elements. Projects that qualify include apartments, condominiums, townhouses and other residential complexes within all market thresholds – affordable housing, market-rate and luxury.

Multifamily residential projects utilize the WELL Certification pathways (i.e., not WELL Core), even though most of the regular occupants are tenants, and the project owner may not complete the fit-out of the dwelling units. Any items installed by residents are not within scope of feature requirements, but do note that these items could impact performance testing results for other features.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Performance testing within dwelling units for precondition features is not required for multifamily residential projects seeking certification at the Bronze or Silver level. However, projects cannot achieve Gold or Platinum without testing conditions in a sample of dwelling units. See Features A01, W01, W02, L02 and T01 and the Sampling Rates for Multifamily Residential section of the WELL Performance Verification Guidebook for more details. For optimizations, testing within dwelling units is required, whether or not the project is targeting Gold or Platinum.

At recertification, for all levels of certification, testing is not required within dwelling units -- only in common areas and spaces dedicated to building management.

SCORING AND AWARDS

WELL CERTIFICATION

Certification represents the highest pinnacle of health achievement across all 10 concepts. Projects must achieve all preconditions, as well as a certain number of points towards different levels of WELL Certification:

Total points achieved	WELL Certification		WELL Core Certification	
	Minimum points per concept	Level of certification	Minimum points per concept	Level of certification
40 pts	0	WELL Bronze	0	WELL Core Bronze
50 pts	1	WELL Silver	0	WELL Core Silver
60 pts	2	WELL Gold	0	WELL Core Gold
80 pts	3	WELL Platinum	0	WELL Core Platinum

Projects may earn no more than 12 points per concept and no more than 100 points total across the ten concepts.

Projects can also pursue an additional ten points in the Innovation concept. If a project earns more than 12 points in any concept, the additional points are counted toward Feature I01, provided the maximum points in the Innovation concept have not yet been reached.

PRECERTIFICATION

WELL Precertification allows project owners to demonstrate a commitment to health and well-being, market the proposed features of a project to potential tenants looking to occupy the space and determine which features the project is likely to achieve during the full WELL Certification review. Unlike WELL Certification – which applies to a completed project – projects still under construction may achieve precertification, using documentation based on current plans rather than as-built conditions. In addition, performance testing results are not applicable/required during precertification.

WELL Precertification requires achievement of all preconditions as well as 40 points in optimizations. Above this minimum, the precertification designation does not further differentiate how many points are successfully reviewed (e.g., there is no “Precertified Gold”).

WELL SCORE

Organizations that subscribe their entire organization (or legal entity) are eligible to receive a WELL Score, a metric that reflects the health and well-being achievements of the entire organization. The WELL Score is a whole number ranging from 0 to 100, which is calculated as the average number of points achieved by the project locations within the organization, weighted by the number of occupants in each location.

Preconditions are not allocated points, but projects that have not met all preconditions contribute a maximum of 49 points toward the WELL Score, even if they have achieved more than 49 points through optimizations.

APPLYING WELL FEATURES

To accurately define the project scope and determine which features apply or may be appropriate for a project, it is important to understand how WELL features apply to different spaces and populations within a building.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

PROJECT BOUNDARY

Defining the boundary of the project pursuing WELL certification, or the borders of the project brings further specificity to the project's scope. The project boundary must be consistently applied across all features. The project boundary may not unreasonably exclude portions of the building, space or site to give the project an advantage in complying with feature requirements. The project must accurately communicate the scope of the project in all promotional and descriptive materials and distinguish it from any space that falls outside of the project boundary. The project pursuing WELL certification should be defined by a clear boundary, such that the project is physically distinct from any portion of spaces not part of the project pursuing WELL certification.

The project boundary can include both interior and exterior spaces. Note that if the project boundary includes exterior (outdoor) spaces, this area is not counted when determining the project's area at registration (including for pricing purposes). For more guidance on how to calculate project size, download the WELL Certification Guidebook.

WELL features (unless otherwise noted in feature language) must be met within the project boundary, including (if applicable) exterior space. One of the pathways in Feature M09 Part 2 requires that projects provide an occupant-accessible outdoor space. For this space to count, it must be within the project boundary and, therefore, within the scope of other features that affect outdoor areas, such as pest management and pesticide use in Feature X10 (if pursued) and illuminance levels on pathways for Feature L02.

Project Boundary Allowances

Some features explicitly enable a space within a certain distance of the project boundary to be used towards feature requirements. Feature language specifies the distance allowed for each strategy. For example, Feature N08 requires a designated eating space within a 200 m [650 ft] walk distance of the project boundary. In these cases, the distance is measured along a pedestrian-accessible path from a functional building entrance (elevation change should not be considered in its calculation). If located outside of the project boundary, the space is not subject to the requirements of other features pursued by the project. These spaces may also be provided within the project boundary, in which case they are subject to other WELL requirements.

Certain features include a certification note for interiors projects that enable them to claim credit for amenities provided by their base building outside the project boundary. For example, an interior fit-out project may use the stairs which connect the entrance to the ground floor (if occupant-accessible) toward Feature V03. If a feature prescribes a certain quantity of amenities (such as the number of long-term bicycle parking spaces in Feature V04), an interiors project may take credit for the base building meeting this feature as long as these amenities are either reserved for the WELL project or sized for all occupants in the building.

SPACE TYPES

All parts of WELL v2 are designated for specific space types. Space types refer to spaces within a project and not the project as a whole. For example, a school might be made up of space types like classrooms, offices, a commercial kitchen and dining areas. Identifying space types within a project can help clarify how WELL features apply to that particular project.

Many parts in WELL features are denoted "For All spaces," an indication the part must be applied to all spaces within the project boundary, for all project types. Depending on the part, there may be distinct requirements for specific space types. These requirements are either required in addition to the requirements for all spaces or used in place of the requirements listed for all other spaces. For example, Feature N01 Part 1 has separate requirements for dining spaces and all other spaces, as indicated in the tab, "For All Spaces except Dining Spaces." Conversely, Feature N01 Part 2 has one set of requirements "For All Spaces" (including Dining Spaces) and additional requirements "For Dining Spaces" only.

Space Type Occupancy

In addition to the classification of space types within a project, WELL v2 also distinguishes spaces based on their level of occupancy:

- **Regularly occupied space:** areas inside the project where a particular individual normally spends at least one continuous hour or, cumulatively, at least two hours per day, such as offices, conference rooms, bedrooms and classrooms.
- **Occupiable space:** spaces that can be occupied for any task or activity, including transition areas or balconies, but excluding spaces that are rarely accessed, such as storage spaces or equipment rooms.

Rooms larger than 930 m^2 [10,000 ft^2] may be divided into separate zones (at least 325 m^2 [3,500 ft^2] each), which may be

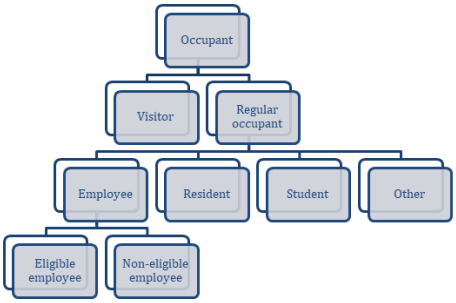
© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

evaluated for occupancy independently. For example, a large room may have one or more small areas (i.e., zones) within it, which are regularly occupied, while the remaining space is not. In this case, the project may identify and label these zones within their floor plan and apply features and performance testing requirements accordingly.

OCCUPANT TYPES

Determining or anticipating who will be present in each phase of a project helps create a complete picture of where and for whom the requirements of WELL features apply. WELL uses specific terminology to refer to groups of individuals that share characteristics. Project teams must employ a single, consistent definition of these terms across relevant features:

- **Occupant:** any individual within the project boundary.
- **Regular occupant:** an individual who spends at least 30 hours per month across at least five days within the project boundary (e.g., employee, resident, student).
- **Visitor:** any occupant who is not a regular occupant (e.g., shopper, museum-goer, hotel guest).
- **Employee:** an individual who works for the project owner within the project boundary.
- **Eligible employee:** an employee identified as qualifying for benefits. At a minimum, this includes all full-time employees but may also include part-time employees, interns, contracted workers and other non-full-time employees as appropriate.



For features that require size or quantity calculations to be performed based on a class of occupants listed in feature language, use the maximum number of occupants of that class to be expected at any given time.

CALCULATIONS

When making calculations for WELL features, do not apply rounding. Instead, use the most expansive interpretation of the result. For example, Feature V02 Part 1 requires adjustable height workstations for "at least 25% of all workstations." In a project with 21 workstations, the required number of workstations would be six, since five desks would only reach 23.8%.

MINIMUM SCOPE OF WELL FEATURES

Certain features require that a minimum scope is met – that is, the minimum level of achievement necessary to achieve a feature related to people, spaces and/or products.

NEWLY INSTALLED PRODUCTS

Some features, particularly in the Materials concept, require that products (such as cleaning products) with specific characteristics or qualities be used or installed in the project. More specifically, the requirements of some features apply to newly installed products -- that is, products installed after project registration.

Preconditions have no minimum scope, and a project without any relevant newly installed materials/products is considered in compliance. For example, Feature X01 restricts mercury in specific categories of newly installed lamps and electronics. If a project installs no lamps or electronics, they are considered in compliance with feature requirements.

For projects to qualify for optimizations that apply to newly installed products or materials, the quantity of products or materials which must comply with feature requirements is specified in the feature language. For example, Feature X05 requires that at least half of newly installed furniture, millwork and fixtures meet the enhanced material restrictions, and there must be at least 10 distinct products within the scope to qualify.

FOODS AND BEVERAGES

A particular category of products pertains to foods and beverages. Projects that do not sell or provide food daily by (or under contract with) the project owner, including catering, are considered in compliance with the Nourishment preconditions. A daily basis is defined as the majority of days in the project's operating week. This is assessed during each week of seasonal operation for

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

projects that do not sell or provide food year-round.

Foods and beverages supplied by the project owner (or by a vendor under contract with the project owner) include but are not limited to items sold or provided in restaurants, cafeterias, cafes, vending machines and items available in kitchen pantry areas. They do not include anything brought into the project by occupants for personal consumption.

Features that apply to commercial dining spaces require on-site food preparation and/or full-service dining. These projects typically include a commercial kitchen and food service staff. Foods prepared on-site include foods assembled on-site and foods prepared for immediate consumption. Projects without these facilities are not eligible to pursue these features.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

© 2020-2024 International WELL Building Institute pbc. All rights reserved.

This WELL Building Standard version 2 ("WELL v2") constitutes proprietary information of the International WELL Building Institute pbc (IWBI). All information contained herein is provided without warranties of any kind, either express or implied, including but not limited to warranties of the accuracy or completeness of the information or the suitability of the information for any particular purpose. Use of this document in any form implies acceptance of these conditions.

IWBI authorizes individual use of WELL v2. In exchange for this authorization, the user agrees:

1. to retain all copyright and other proprietary notices contained in WELL v2,
2. not to sell or modify WELL v2, and
3. not to reproduce, display or distribute WELL v2 in any way for any public or commercial purpose.
4. To ensure that any and all authorized uses of WELL v2, including excerpts thereof, are accompanied by attribution, including to the appropriate addendum.

Unauthorized use of WELL v2 violates copyright, trademark and other laws and is prohibited.

INTERNATIONAL WELL BUILDING INSTITUTE, IWBI, THE WELL BUILDING STANDARD, THE WELL COMMUNITY STANDARD, WELL CERTIFIED , WELL PORTFOLIO, WELL PORTFOLIO SCORE, WELL AP, THE WELL CONFERENCE, WELL™, and others and their related logos are trademarks or certification marks of the International WELL Building Institute pbc in the United States nd other countries. All third-party trademarks and Standards referenced herein such as GREEN STAR™, BREEAM™, LEED™ and others are trademarks and/or Standards of their respective owners.

Disclaimer

None of the parties involved in the funding or creation of WELL v2, including IWBI, or its affiliates, members, employees, 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 WELL v2, or for any injuries, losses, or damages (including, without limitation, equitable relief) arising from such use or reliance. Although the information contained in WELL v2 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 Building Standard, WELL v2, the WELL Community Standard pilot and resources related to the foregoing are intended to educate and assist organizations, building stakeholders, real estate owners, tenants, occupants and other users in their efforts to create healthier spaces, organizations and communities, and nothing in the WELL Building Standard, WELL v2, the WELL Community Standard pilot and related resources should be considered, or used as a substitute for, quality control, safety analysis, legal compliance (including zoning), comprehensive urban planning, medical advice, diagnosis or treatment.

As a condition of use, the user covenants not to sue and agrees to waive and release IWBI, its affiliates, members, 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 Building Standard, WELL v2 and/or The WELL Community Standard pilot.

About the WELL Building Standard (WELL™)

Launched in October 2014 after six years of research and development, WELL is the premier Standard for buildings, interior spaces and communities seeking to implement, validate and measure interventions that support and advance human health and wellness.

WELL was developed by integrating scientific and medical research and literature on environmental health, behavioral factors, health outcomes and demographic risk factors that affect human health with leading practices in design, operations and management. WELL also references existing standards and best practice guidelines set by governmental and professional organizations.

About the International WELL Building Institute™ (IWBI™)

The International WELL Building Institute (IWBI) is leading the global movement to transform our buildings, organizations and communities in ways that help people thrive. IWBI delivers the cutting-edge WELL Building Standard, the first standard to be focused exclusively on the ways that buildings, and everything in them, can improve our comfort, drive better choices, and generally enhance, not compromise, our health and wellness.

IWBI's work extends to advancing health through design for entire neighborhoods through the WELL Community Standard, and convening and mobilizing the wellness community through management of the WELL AP credential.

WELL Certification and the WELL AP credentialing program are third-party administered through IWBI's collaboration with Green Business Certification Inc. (GBCI), which also administers LEED certification, the global green building program, and the LEED professional credentialing program.

AIR

The WELL Air concept aims to achieve high levels of indoor air quality across a building's lifetime through a range of strategies that include source elimination or reduction, active and passive building design and operation strategies and human behavior interventions.

The WELL Air concept aims to ensure high levels of indoor air quality across a building's lifetime through a range of strategies that include source elimination or reduction, active and passive building design and operation strategies 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 include asthma attacks, infection with Legionella bacteria 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. EPA 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, about 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 all 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 WELL 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] The WELL Air Concept seeks to implement holistic design strategies to promote clean air and minimize human exposure to harmful contaminants, in order to maximize benefits to productivity, well-being and health.

Note : Read more about the evidence behind the WELL Air Concept. Note: Material from the research digests is not covered on the WELL AP exam.

REFERENCES

1. Klepeis NE, Nelson WC, Ott WR, et al. The National Human Activity Pattern Survey (NHAPS): A resource for assessing exposure to environmental pollutants. J Expo Anal Environ Epidemiol. 2001;11(3):231-252. doi:10.1038/sj.jea.7500165
2. Joshi S. The sick building syndrome. Indian J Occup Environ Med. 2008;12(2):61. doi:10.4103/0019-5278.43262
3. Selgrade MK, Plopper CG, Gilmour MI, Conolly RB, Foos BSP. Assessing the health effects and risks associated with children's inhalation exposures - Asthma and allergy. J Toxicol Environ Heal - Part A Curr Issues. 2008;71(3):196-207. doi:10.1080/15287390701597897
4. U.S. Environmental Protection Agency. Indoor Air Pollution: An Introduction for Health Professionals. https://www.epa.gov/indoor-air-quality-iaq/indoor-air-pollution-introduction-health-professionals.
5. Jacobs DE, Kelly T, Sobolewski J. Linking public health, housing, and indoor environmental policy: Successes and challenges at local and federal agencies in the United States. Environ Health Perspect. 2007;115(6):976-982. doi:10.1289/ehp.8990
6. Cooperative Extension Service, University of Kentucky. Common Indoor Air Pollutants: Sources And Health Impacts. 2000. http://www2.ca.uky.edu/hes/fcs/factshts/HF-LRA.161.PDF.
7. U.S. Environmental Protection Agency. Volatile Organic Compounds' Impact on Indoor Air Quality. https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality.
8. Wallace LA, Pellizzari E, Leaderer B, Zelon H, Sheldon L. Emissions of volatile organic compounds from building

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

materials and consumer products. Atmos Environ. 1987;21(2):385-393. doi:10.1016/0004-6981(87)90017-5

9. Takaro TK, Krieger J, Song L, Sharify D, Beaudet N. The Breathe-Easy home: The impact of asthma-friendly home construction on clinical outcomes and trigger exposure. Am J Public Health. 2011;101(1):55-62. doi:10.2105/AJPH.2010.300008
10. Krieger J, Jacobs DE, Ashley PJ, et al. Housing interventions and control of asthma-related indoor biologic agents: a review of the evidence. J Public Health Manag Pract. 2010;16(5 Suppl):S11-S20. doi:10.1097/phh.0b013e3181fce56a
11. Health Effects Institute. A Special Report on Global Exposure To Air Pollution and Its Disease Burden.; 2017. https://ccacoalition.org/en/resources/state-global-air-2017-special-report-global-exposure-air-pollution-and-its-disease-burden.
12. Gakidou E, Afshin A, Abajobir AA, et al. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016. Lancet. 2017;390(10100):1345-1422. doi:10.1016/S0140-6736(17)32366-8
13. World Health Organization. 7 Million Premature Deaths Annually Linked to Air Pollution.; 2014. http://www.who.int/mediacentre/news/releases/2014/air-pollution/en/.
14. World Health Organization. Burden of Disease from Household Air Pollution for 2012: Summary of Results. Geneva, Switzerland; 2012. http://www.who.int/phe/health_topics/outdoorair/databases/FINAL_HAP_AAP_BoD_24March2014.pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A01 AIR QUALITY | P

Intent : Provide a basic level of indoor air quality that contributes to the health and well-being of building users.

Summary : This WELL feature requires projects to provide acceptable air quality levels, as determined by public health authorities.

Issue : Exposure to air pollutants, such as Volatile Organic Compounds (VOCs), ozone, particulate matter, carbon monoxide and others has been shown to increase the risk of respiratory and cardiovascular diseases, in addition to causing thousands of cancer deaths annually.1 Inhaling pollutants presents symptoms including headaches, dry throat, eye irritation and runny nose that may later develop into extreme health outcomes, such as asthma attacks and cancer.2–4 In addition, radon exposure is the second leading cause of lung cancer, after tobacco use.5 Therefore, it is important to define indoor air quality levels that minimize risk to human health.

Solutions : The World Health Organization (WHO) and other regulatory bodies, such as the U.S. Environmental Protection Agency (EPA) identify a list of "criteria" air pollutants. 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. Achieving the goal of clean indoor air as defined by permissible levels, requires the joint efforts of both professionals and building users in the implementation of adequate approaches. Indoor air quality can be properly managed through different features listed in the WELL Air concept, including source control strategies, passive and active building design and operation strategies and human behavior interventions. Effective mechanical ventilation is particularly effective at bringing radon below acceptable thresholds.6,7

PART 1 MEET THRESHOLDS FOR PARTICULATE MATTER

For All Spaces except Commercial Kitchen Spaces & Industrial:

Option 1: Acceptable thresholds

The following thresholds are met in occupiable spaces:

a. $PM_{2.5}$: 15 µg/m^3 or lower.[8]

b. PM_{10}: 50 µg/m^3 or lower.[9]

OR

Option 2: Modified thresholds in polluted regions

Note: Projects pursuing this strategy are limited in WELL Certification level to Gold regardless of total points achieved.

For buildings where the annual average outdoor PM2.5 level is 35 µg/m^3 or higher, the following thresholds are met:

a. $PM_{2.5}$: 25 µg/m^3 or lower.[10]

b. PM_{10}: 50 µg/m^3 or lower.[10]

OR

Option 3: Dynamic thresholds in polluted regions

Note: Projects pursuing this strategy are limited in WELL Certification level to Silver regardless of total points achieved.

For buildings where the annual average outdoor PM2.5 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:

Option 1: Acceptable thresholds

The following threshold is met:

a. $PM_{2.5}$: 35 µg/m^3 or lower.[8]

OR

Option 2: Dynamic thresholds in polluted regions

Note: Projects pursuing this strategy are limited in WELL Certification level to Silver regardless of total points achieved.

For buildings where the annual average outdoor PM2.5 level is 35 µg/m^3 or higher, the following thresholds are met:

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 :

Multifamily residential projects may achieve WELL Certification at the Bronze or Silver level without testing in dwelling units, but cannot achieve Gold or Platinum without testing in dwelling units. See Sampling Rates for Multifamily Residential in the WELL Performance Verification Guidebook for further details.

The World Health Organization's Global Urban Ambient Air Pollution Database may be consulted to view outdoor air quality levels, available at https://www.who.int/data/gho/data/themes/air-pollution/who-air-quality-database.

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

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

PART 2 MEET THRESHOLDS FOR ORGANIC GASES

For All Spaces:

Option 1: Laboratory-based VOC tests

The following thresholds are met in occupiable spaces:

a. Benzene (CAS 71-43-2): 10 µg/m³ or lower.[11]

b. Formaldehyde (CAS 50-00-0): 50 µg/m³ or lower.[12]

c. Toluene (CAS 108-88-3): 300 µg/m³ or lower.[13]

OR

Option 2: TVOC continuous monitoring

The following threshold is met in occupiable spaces:

a. Total VOC: 500 µg/m³ or lower.

Note : Projects undergoing recertification which were previously awarded Feature A08 must consider all data collected since the previous (re)certification.

Note :

Multifamily residential projects may achieve WELL Certification at the Bronze or Silver level without testing in dwelling units, but cannot achieve Gold or Platinum without testing in dwelling units. See Sampling Rates for Multifamily Residential in the WELL Performance Verification Guidebook for further details.

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

PART 3 MEET THRESHOLDS FOR INORGANIC GASES

For All Spaces except Commercial Kitchen Spaces & Industrial:

The following thresholds are met in occupiable spaces:

a. Carbon monoxide: 10 mg/m³ [9 ppm] or lower.[8]

b. Ozone: 100 µg/m³ [51 ppb] or lower.[10]

For Commercial Kitchen Spaces & Industrial:

The following thresholds are met:

a. Carbon monoxide: 34 mg/m³ [30 ppm] or lower.[14]

b.

Ozone: 100 µg/m³ [51 ppb] or lower.[10]

Note :

Multifamily residential projects may achieve WELL Certification at the Bronze or Silver level without testing in dwelling units, but cannot achieve Gold or Platinum without testing in dwelling units. See Sampling Rates for Multifamily Residential in the WELL Performance Verification Guidebook for further details.

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

PART 4 MEET THRESHOLDS FOR RADON

For All Spaces:

Option 1: Radon testing

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. One test is conducted per 25,000 ft² of regularly occupied space.

OR

Option 2: Mechanical ventilation

For regularly occupied spaces at or below grade, the following requirement is met:

a. All regularly occupied spaces at or below grade meet Feature A03, Part 1, Option 1.

OR

Option 3: Above-grade

One of the following requirements are met in regularly occupied spaces:

a. Is completely located on or above the third floor of the building.

b. Is constructed with raised-pier foundations (e.g., without a solid perimeter wall) and all mechanical equipment is elevated off the ground.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

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

PART 5 MEASURE AIR PARAMETERS

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. PM2.5

b. PM10.

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.

REFERENCES

1. Franklin BA, Brook R, Arden Pope C. Air pollution and cardiovascular disease. Curr Probl Cardiol. 2015;40(5):207-238. doi:10.1016/j.cpcardiol.2015.01.003
2. Joshi S. The sick building syndrome. Indian J Occup Environ Med. 2008;12(2):61. doi:10.4103/0019-5278.43262
3. Selgrade MK, Plopper CG, Gilmour MI, Conolly RB, Foos BSP. Assessing the health effects and risks associated with children's inhalation exposures - Asthma and allergy. J Toxicol Environ Heal - Part A Curr Issues. 2008;71(3):196-207. doi:10.1080/15287390701597897
4. U.S. Environmental Protection Agency. Indoor Air Pollution: An Introduction for Health Professionals. https://www.epa.gov/indoor-air-quality-iaq/indoor-air-pollution-introduction-health-professionals.
5. World Health Organization. WHO Handbook on Indoor Radon: A Public Health Perspective. Presented at the: 2009. https://www.who.int/ionizing_radiation/env/9789241547673/en/.
6. Yang S, Goyette Pernot J, Hager Jörin C, Niculita-Hirzel H, Perret V, Licina D. Radon Investigation in 650 Energy Efficient Dwellings in Western Switzerland: Impact of Energy Renovation and Building Characteristics. Atmosphere (Basel). 2019;10(12):777. doi:10.3390/atmos10120777
7. Hadlich DE, Grimsrud DT. Radon in Institutional Buildings : The Impacts of Conservation Strategies. Radon Institutional Build Impacts. 1991;(1990).
8. U.S. Environmental Protection Agency. NAAQS Table. https://www.epa.gov/criteria-air-pollutants/naaqs-table.
9. European Commission. Proposal for a directive of the European Parliament and of the Council on ambient air quality and cleaner air for Europe - COM(2005) 447 Final. Off J Eur Union. 2005;0183:1-67.
10. World Health Organization. Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide. Geneva, Switzerland; 2005. http://apps.who.int/iris/bitstream/handle/10665/69477/WHO_SDE_PHE_OEH_06.02_eng.pdf;jsessionid=CD44465F sequence=1.
11. French Agency for Food Environmental and Occupational Health and Safety. ANSES's List of Indoor Air Quality Guideline Values.; 2018. https://www.anses.fr/fr/system/files/Tableau_VGAI_Juillet2018EN.pdf.
12. Health Canada. Residential Indoor Air Quality Guideline: Formaldehyde.; 2006. https://www.canada.ca/content/dam/canada/health-canada/migration/healthy-canadians/publications/healthy-living-vie-saine/formaldehyde/alt/formaldehyde-eng.pdf.
13. California Office of Environmental Health Hazard Assessment. Acute, 8-hour and Chronic Reference Exposure Level (REL) Summary. https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary. Published 2019.
14. Health and Safety Executive. EH40/2005 Workplace Exposure Limits.; 2011. http://www.hse.gov.uk/pUbns/priced/eh40.pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A02 SMOKE-FREE ENVIRONMENT | P

Intent : Deter smoking, minimize occupant exposure to secondhand smoke and reduce smoke pollution.

Summary : This WELL feature requires projects to ban indoor smoking and ban or restrict outdoor smoking within its boundaries.

Issue : Exposure to tobacco smoke has continued to detrimentally affect the health of both smokers and those exposed to secondhand smoke. Ingredients in cigarettes form over 7,000 compounds when burned, of which at least 69 are known to be carcinogenic.[1] As a result, the average life expectancy of a smoker is 10 years less than that of a nonsmoker.[2] Furthermore, secondhand smoke exposes nonsmokers to the same contaminants, increasing the number of people subject to health risks from smoking. The thirdhand smoke (residual chemicals left on indoor surfaces by tobacco smoke) clings to walls, furniture, clothing, bedding, carpets and other surfaces, long after smoking has occurred. Emerging evidence suggests that there are serious health consequences associated with exposure to thirdhand tobacco smoke,[3] secondhand marijuana smoke and emissions from e-cigarettes.[4,5] Health issues associated with tobacco smoke include asthma attacks, respiratory infections, coronary heart disease, stroke, lung cancer and sudden infant death syndrome.[6] Despite these adverse impacts on health, 80% of the global population lives in countries not protected by 100% smoke-free regulations.[7]

Solutions : There is no safe and acceptable level of cigarette smoke exposure.[8] Therefore, the only way to protect people from secondhand and thirdhand smoke is to implement a 100% smoke-free environment.[8–10] In order to prevent intrusion of cigarette smoke from the outdoors, projects must also take steps to ensure that smoking is not allowed in the vicinity of building entrances, operable windows and building air intakes.[11]

PART 1 PROHIBIT INDOOR SMOKING

For All Spaces:

The following requirement is met:

a. Smoking and the use of e-cigarettes is prohibited in interior spaces within the project boundary.[12]

PART 2 PROHIBIT OUTDOOR SMOKING

For All Spaces:

Option 1: No smoking signage

The following requirements are met:

a.

Clear and visible permanent signage prohibiting smoking and vaping is located within 3 m of all functional building entrances, operable windows and building air intakes that open to any occupiable outdoor area.

b. Clear and visible permanent signage describing the hazards of smoking is located in all outdoor areas designated for smoking and vaping.

OR

Option 2: No applicable outdoor spaces

The following are not present within the project boundary:

a. Any occupiable outdoor areas (e.g., decks, patios, balconies, rooftops, walkways)

b. Functional building entrances.

REFERENCES

1. National Cancer Institute. Harms of Cigarette Smoking and Health Benefits of Quitting. https://www.cancer.gov/about-cancer/causes-prevention/risk/tobacco/cessation-fact-sheet.
2. Jha P, Ramasundarahettige C, Landsman V, et al. 21st-Century Hazards of Smoking and Benefits of Cessation in the United States. N Engl J Med. 2013;368(4):341-350. doi:10.1056/NEJMsa1211128
3. Matt GE, Quintana PJE, Destaillats H, et al. Thirdhand tobacco smoke: Emerging evidence and arguments for a multidisciplinary research agenda. Environ Health Perspect. 2011;119(9):1218-1226. doi:10.1289/ehp.1103500
4. Wang X, Derakhshandeh R, Liu J, et al. One Minute of Marijuana Secondhand Smoke Exposure Substantially. J Am Heart Assoc. 2016;5(8):1-11. doi:10.1161/JAHA.116.003858
5. Mello S, Bigman CA, Sanders-Jackson A, Tan ASL. Perceived harm of secondhand electronic cigarette vapors and policy support to restrict public vaping: Results from a national survey of US adults. Nicotine Tob Res. 2016;18(5):686-693. doi:10.1093/ntr/ntv232
6. U.S. Department of Health and Human Services. The Health Consequences of Smoking: 50 Years of Progress: A Report of the Surgeon General. Rockville, MD; 2014. https://www.ncbi.nlm.nih.gov/books/NBK179276/pdf/Bookshelf_NBK179276.pdf.
7. World Health Organization. WHO Report on the Global Tobacco Epidemic, 2017 - Monitoring Tobacco Use and Prevention Policies. Geneva, Switzerland; 2017. http://apps.who.int/iris/bitstream/handle/10665/255874/9789241512824-eng.pdf?sequence=1%0Ahttps://www.world-heart-federation.org/wp-content/uploads/2017/07/WHO-Report-on-the-global-tobacco-epidemic-2017-EMBARGOED.pdf%0Ahttp://apps.who.int/iris/bitstream/1.
8. International Agency for Research on Cancer. Evaluating the Effectiveness of Smoke-Free Policies. Geneva, Switzerland; 2009. https://www.iarc.fr/wp-content/uploads/2018/07/handbook13.pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

9. Gan Q, Hammond SK, Jiang Y, Yang Y, Hu TW. Effectiveness of a smoke-free policy in lowering secondhand smoke concentrations in offices in China. J Occup Environ Med. 2008;50(5):570-575. doi:10.1097/JOM.0b013e3181638640
10. MacNaughton P, Adamkiewicz G, Arku RE, Vallarino J, Levy DE. The impact of a smoke-free policy on environmental tobacco smoke exposure in public housing developments. Sci Total Environ. 2016;557-558:676-680. doi:10.1016/j.scitotenv.2016.03.110
11. Kaufman P, Zhang B, Bondy SJ, Klepeis N, Ferrence R. Not just "a few wisps": Real-time measurement of tobacco smoke at entrances to office buildings. Tob Control. 2011;20(3):212-218. doi:10.1136/tc.2010.041277
12. New York State Department of Health. NYS Public Health Law, Article 13-E: Regulation of Smoking in Public and Work Places. New York, NY; 2014. https://www.nysenate.gov/legislation/laws/PBH/A13-E.
13. U.S. Green Building Council. LEED BD+C: New Construction | v4 - LEED v4. 2018. https://www.usgbc.org/sites/default/files/LEED v4 BDC_07.2.18_current.pdf.
14. Hammond D, Fong GT, McNeill A, Borland R, Cummings KM. Effectiveness of cigarette warning labels in informing smokers about the risks of smoking: Findings from the International Tobacco Control (ITC) Four Country Survey. Tob Control. 2006;15(SUPPL. 3):iii19-25. doi:10.1136/tc.2005.012294

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A03 VENTILATION DESIGN | P

Intent : Minimize indoor air quality issues through the provision of adequate ventilation.

Summary : This WELL feature requires projects to bring in fresh air from the outside through mechanical and/or natural means in order to dilute human- and product-generated air pollutants.

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).[1,2] Poor ventilation is also linked to increased rates of employee absences, higher operational costs for businesses and decreased productivity in students.[3,4] 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.[5] Therefore, the economic costs of SBS in under-ventilated buildings are significant and far exceed the energy-related cost savings. [6–8]

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.[9,10] In addition to proper HVAC system design, mechanically ventilated projects need to perform regular system maintenance, since inadequate maintenance is associated with reduced ventilation performance and a deterioration in indoor air quality and thermal conditions.[11] For naturally ventilated spaces, it is necessary to ensure that adequate outdoor air quality and noise levels are met.

PART 1 ENSURE ADEQUATE VENTILATION

For All Spaces:

Option 1: Mechanically ventilated spaces

For mechanically ventilated buildings, one of the following requirements is met:

a. Newly installed ventilation systems are designed to meet the supply and exhaust rates set in one or more of the following ventilation guidelines, which must describe ventilation rates for at least 90% of the project area. The ventilation system is scheduled to be tested and balanced after project occupancy:
    1. ASHRAE 62.1-2010 or any more recent versions (Ventilation Rate Procedure or IAQ Procedure).[12]
    2. ASHRAE 62.2-2016.[13]
    3. EN 16798-1.[14]
    4. AS 1668.2-2012 or any more recent version.[15]
    5. CIBSE Guide A: Environmental Design, version 2007 or any more recent version.[16]

b. Existing ventilation systems have been tested and balanced to meet supply and exhaust rates set in one or more ventilation guidelines listed above within the last five years.

OR

Option 2: Naturally ventilated spaces

For naturally ventilated buildings with no mechanical ventilation, the following requirements are met:

a. One or more of the following design criteria, which must describe ventilation rates for at least 90% of the project area:
    1. Natural Ventilation Procedure in ASHRAE 62.1-2010 or any more recent version.[12]
    2. CIBSE AM10: Natural Ventilation in Non-Domestic Buildings (2005 or any more recent version) Section 2.4 – Natural ventilation strategies and Chapter 4 – Design Calculations.[17]
    3. AS 1668.4-2012 or any more recent version.[15]
    4. Any reference in Option 1, which describes natural ventilation procedures.

b. Vents and windows used to meet the ventilation requirements in one of the standards mentioned above are permanently open or have controls to prevent their closure during periods of occupancy. (Operable windows not used in ventilation calculations may be user operated.)

c. Outdoor air meets the following thresholds as an average for the previous year:
    1. $PM_{2.5}$ less than 15 µg/m^3.[18]
    2. PM_{10} less than 30 µg/m^3.[18]

OR

Option 3: Naturally ventilated spaces in areas with elevated particulate matter

Note: Projects pursuing this strategy are limited in WELL Certification level to Silver regardless of total points achieved.

For naturally ventilated buildings with no mechanical ventilation, the following requirements are met:

a. One or more of the following design criteria, which must describe ventilation rates for at least 90% of the project area:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

1. Natural Ventilation Procedure in ASHRAE 62.1-2010 or any more recent version.[12]
2. CIBSE AM10: Natural Ventilation in Non-Domestic Buildings (2005 or any more recent version) Section 2.4 – Natural ventilation strategies and Chapter 4 – Design Calculations.[17]
3. AS 1668.4-2012 or any more recent version.[15]
4. Any reference in Option 1, which describes natural ventilation procedures.

b. Vents and windows used to meet the ventilation requirements in one of the standards mentioned above are permanently open or have controls to prevent their closure during periods of occupancy. (Operable windows not used in ventilation calculations may be user operated.)

c. Outdoor air meets the following thresholds as an average for the previous year:
   1. $PM_{2.5}$ less than 35 µg/m^3.[18]
   2. PM_{10} less than 70 µg/m^3.[18]

OR

Option 4: Ventilation monitoring

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

a. 900 ppm or less.

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.

Note :
Mixed mode projects must meet the requirements set for naturally ventilated spaces when mechanical system is not in use and the requirements for mechanical ventilation when the mechanical system is in use. The project must use mechanical ventilation when outdoor $PM_{2.5}$ levels are above 15 µg/m^3, based on a measuring device within 2.5 mi of the project.

REFERENCES

1. Wargocki P, Wyon DP, Sundell J, Clausen G, Fanger PO. The effects of outdoor air supply rate in an office on perceived air quality, sick building syndrome (SBS) symptoms and productivity. Indoor Air. 2000;10(4):222-236. https://onlinelibrary.wiley.com/doi/epdf/10.1034/j.1600-0668.2000.010004222.x.
2. Daisey JM, Angell WJ, Apte MG. Indoor air quality, ventilation and health symptoms in schools: An analysis of existing information. Indoor Air. 2003;13(1):53-64. doi:10.1034/j.1600-0668.2003.00153.x
3. Haverinen-Shaughnessy U, Moschandreas DJ, Shaughnessy RJ. Association between substandard classroom ventilation rates and students' academic achievement. Indoor Air. 2011;21(2):121-131. doi:10.1111/j.1600-0668.2010.00686.x
4. Chan WR, Parthasarathy S, Fisk WJ, Mckone TE. Estimated effect of ventilation and filtration on chronic health risks in U.S. offices, schools, and retail stores. Indoor Air. 2016;26(2):331-343. doi:10.1111/ina.12189
5. Milton DK, Glencross PM, Walters MD. Risk of sick leave associated with outdoor air supply rate, humidification, and occupant complaints. Indoor Air. 2000;10(4):212-221. https://buildequinox.com/files/iaq/milton_vent_sick_rates.pdf.
6. Redlich CA, Sparer J, Cullen MR. Sick-building syndrome. Lancet (London, England). 1997;349(9057):1013-1016. https://www.ncbi.nlm.nih.gov/pubmed/9100639.
7. Fisk WJ. Estimates of improved productivity and health from better indoor environments. Indoor Air. 1997;7(3):158-172. doi:10.1111/j.1600-0668.1997.t01-1-00002.x
8. Fisk WJ. How IEQ affects health, productivity. ASHRAE. 2002;44(5).
9. Sundell J, Levin H, Nazaroff WW, et al. Ventilation rates and health: Multidisciplinary review of the scientific literature. Indoor Air. 2011;21(3):191-204. doi:10.1111/j.1600-0668.2010.00703.x
10. Carrer P, Wargocki P, Fanetti A, et al. What does the scientific literature tell us about the ventilation-health relationship in public and residential buildings? Build Environ. 2015;94(P1):273-286. doi:10.1016/j.buildenv.2015.08.011
11. Hanssen SO. HVAC - The importance of clean intake section and dry air filter in cold climate. Indoor Air, Suppl. 2004;14(SUPPL. 7):195-201. doi:10.1111/j.1600-0668.2004.00288.x
12. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 62.1-2010: Ventilation for Acceptable Indoor Air Quality.; 2010.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

13. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 62.2-2016: Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. https://www.ashrae.org/technical-resources/standards-and-guidelines/standards-addenda/addenda-to-standard-62-2-2016. Published 2016.
14. European Committee for Standardization. EN 16798-1:2019 - Ventilation for Buildings. 2019. https://standards.cen.eu/dyn/www/f?p=204:110:0::::FSP_PROJECT,FSP_ORG_ID:41425,6138&cs=11EDD0CE838BCEF1A1EFA39A24B6C9890.
15. Standards Australia. AS 1668-2012 The Use of Ventilation and Air-Conditioning in Buildings. Sydney; 2012.
16. Chartered Institution of Building Services Engineers. CIBSE Guide A: Environmental Design. Chartered Institution of Building Services Engineers; 2007. doi:10.1016/B978-0-240-81224-3.00016-9
17. Chartered Institution of Building Services Engineers. AM 10 Natural Ventilation in Non Domestic Buildings.; 2005. https://www.cibse.org/knowledge/knowledge-items/detail?id=a0q20000008I7m2AAC.
18. World Health Organization. Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide. Geneva, Switzerland; 2005. http://apps.who.int/iris/bitstream/handle/10665/69477/WHO_SDE_PHE_OEH_06.02_eng.pdf;jsessionid=CD44465Fsequence=1.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A04 CONSTRUCTION POLLUTION MANAGEMENT | P

Intent : Minimize the introduction of construction-related pollutants into indoor air, remediate construction-related indoor air contamination for human health and protect building products from degradation.

Summary : This WELL feature requires projects to protect indoor air quality during building construction and renovation through a combination of strategies, such as duct protection, moisture and dust management, filter replacement, and proper equipment selection.

Issue : Air pollution originating from construction and demolition works can impact the health and quality of life of people working and residing nearby and is associated with increased mortality, due to chronic obstructive pulmonary disease.[1] Increased emissions of PM_{10} in the vicinity of construction sites are positively correlated with people's suffering from respiratory diseases.[2] Building construction and renovations are primarily a source of coarse particulate matter, but they are also a source of airborne ultrafine particles. [3]

Solutions : The indoor air quality levels can be compromised during building construction. Care should be taken during construction to prevent dust intrusion and/or to clear the space of dust, chemical vapors and other debris to avoid significant aggravation of indoor air quality. Air duct protection, moisture and dust management, filter replacement and proper equipment selection are strategies that improve indoor air quality, by limiting the exposure to an intense contamination period.[4]

PART 1 MITIGATE CONSTRUCTION POLLUTION

For All Spaces:

Option 1: Manage construction pollution

For construction occurring after enrollment or the start of subscription, the following requirements are met:

a. Ducts are maintained per one of the below:
    1. Ducts are sealed and protected from possible contamination during construction.[5]
    2. Ducts are cleaned prior to installing registers, grills and diffusers.
b. If permanently installed ventilation system is operating during construction, filters must meet the following:
    1. Media filters with an average removal efficiency of ≥ 70% for particles 3-10 µm in size (e.g., MERV 8, M5 or ePM10 70%) are used to filter return air.[6]
    2. All filters are replaced prior to occupancy.[5]
c. The project implements the following moisture and dust management procedures:
    1. Carpets, acoustical ceiling panels, fabric wall coverings, insulation, upholstery and furnishings and other absorptive materials are stored separately in a designated area protected from moisture damage.[5]
    2. All active areas of work are isolated from other spaces by sealed doorways or windows or through the use of temporary barriers.[5]
    3. Walk-off mats are used at entryways to reduce the transfer of dirt and pollutants.[5]
    4. Saws and similar tools use dust guards or collectors to capture generated dust.[5]

OR

Option 2: No construction activities

The following requirement is met:

a. The project has not undergone construction activities after enrollment.

REFERENCES

1. Bergdahl IA, Torén K, Eriksson K, et al. Increased mortality in COPD among construction workers exposed to inorganic dust. Eur Respir J. 2004;23(3):402-406. doi:10.1183/09031936.04.00034304
2. Ravinder Singh, Kafeel Ahmad DCJ and MSK. Impact of Air Quality on Human Health In The Vicinity of Construction Sites in Delhi-NCR. Int J Eng Res Appl. 2014;4(8):18-26. http://www.ijera.com/papers/Vol4_issue8/Version 4/C48041826.pdf.
3. Kumar P, Mulheron M, Som C. Release of ultrafine particles from three simulated building processes. J Nanoparticle Res. 2012;14(4):771. doi:10.1007/s11051-012-0771-2
4. Indoor Air Quality Program. Construction and renovation generated pollutants in occupied buildings. https://www.mass.gov/service-details/constructionrenovation-generated-pollutants-in-occupied-buildings.
5. U.S. Green Building Council. LEED BD+C: New Construction | v4 - LEED v4. 2018. https://www.usgbc.org/resources/leed-v4-building-design-and-construction-current-version https://www.usgbc.org/resources/leed-v4-building-design-and-construction-current-version.
6. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 52.2-2017: Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size. 2017. https://www.techstreet.com/ashrae/standards/ashrae-52-2-2017?product_id=1942059.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A05 ENHANCED AIR QUALITY | O (MAX : 4 PT)

Intent : Encourage and recognize buildings with enhanced levels of indoor air quality that promote the health and well-being of people.

Summary : This WELL feature requires projects to go beyond current guidelines to provide enhanced air quality levels that have been linked to improved human health and performance.[1,2]

Issue : The quality of the air people breathe indoors directly impacts their health and well-being and constitutes one of the most important aspects of buildings that can support human health. Researchers have also identified a clear relationship between indoor air quality and human productivity in buildings.[3] An average of 10% of productivity loss could be attributable to health issues related to poor indoor air quality in office buildings.[4] There is also an emerging body of evidence that air pollution can disrupt physical and cognitive development in children.[5] 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.[6] The premature mortality rate could be reduced by up to 15%, if PM_{10} is reduced from 70 to 20 $\mu g/m^3$.[7] As a result, enhanced air quality is positively correlated with improved health, cognitive and physical development, higher incomes and better economic performance.[1,2]

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.

PART 1 MEET ENHANCED THRESHOLDS FOR PARTICULATE MATTER (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	Points
1	$PM_{2.5}$: 12 $\mu g/m^3$ or lower.[8] PM_{10}: 30 $\mu g/m^3$ or lower.[9]	1
2	$PM_{2.5}$: 10 $\mu g/m^3$ or lower.[9] PM_{10}: 20 $\mu g/m^3$ or lower.[9]	2

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

PART 2 MEET ENHANCED THRESHOLDS FOR ORGANIC GASES (MAX : 1 PT)

For All Spaces:

The following thresholds are met in occupiable spaces:

a. Acetaldehyde: 140 $\mu g/m^3$ or lower.[10]

b. One of the following:
   1. Acrylonitrile: 5 $\mu g/m^3$ or lower.[10]
   2. Caprolactam: 2.2 $\mu g/m^3$ or lower.[10]

c. Benzene: 3 $\mu g/m^3$ or lower.[10]

d. Formaldehyde: 9 $\mu g/m^3$ or lower.[10]

e. Naphthalene: 9 $\mu g/m^3$ or lower.[10]

f. Toluene: 300 $\mu g/m^3$ or lower.[10]

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

PART 3 MEET ENHANCED THRESHOLDS FOR INORGANIC GASES (MAX : 1 PT)

For All Spaces:

The following thresholds are met:

a. Carbon monoxide: 7 mg/m^3 [6 ppm] or lower.[11]

b. Nitrogen dioxide: 40 $\mu g/m^3$ [21 ppb] or lower.[11]

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

REFERENCES

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

1. Porta D, Narduzzi S, Badaloni C, et al. Air pollution and cognitive development at age 7 in a prospective Italian birth cohort. Epidemiology. 2016;27(2):228-236. doi:10.1097/EDE.0000000000000405
2. U.S. Environmental Protection Agency. Highlights from the Clean Air Act 40th Anniversary. https://www.epa.gov/clean-air-act-overview/highlights-clean-air-act-40th-anniversary.
3. Horr, A., Kaushik, A., Mazroei, A., Katafygiotou, A. & Elsarrag E. Occupant productivity and office indoor environment quality : a review of the literature Occupant Productivity and Office Indoor Environment Quality : A Review of the Literature. 2016. http://usir.salford.ac.uk/39106/3/BAE-D-16-00533_final%2520manuscript%5B1%5D.pdf.
4. Dorgan, CE, Dorgan C. Assessment of link between productivity and indoor air quality. In: Creating the Productive Workplace. ; 2005. https://www.taylorfrancis.com/books/e/9781134265978/chapters/10.4324%2F9780203696880-20.
5. Calderón-Garcidueñas L, Torres-Jardón R, Kulesza RJ, Park S Bin, D'Angiulli A. Air pollution and detrimental effects on children's brain. The need for a multidisciplinary approach to the issue complexity and challenges. Front Hum Neurosci. 2014;8(AUG):1-7. doi:10.3389/fnhum.2014.00613
6. Laumbach RJ, Kipen HM. Respiratory health effects of air pollution: Update on biomass smoke and traffic pollution. J Allergy Clin Immunol. 2012;129(1):3-11. doi:10.1016/j.jaci.2011.11.021
7. The Organisation for Economic Co-operation and Development. OECD Environmental Outlook to 2050: The Consequences of Inaction. Paris, France: OECD Publishing; 2012. https://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/internationellt-miljoarbete/multilateralt/oecd/outolook-2050-oecd.pdf.
8. U.S. Environmental Protection Agency. NAAQS Table. https://www.epa.gov/criteria-air-pollutants/naaqs-table.
9. World Health Organization. Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide. Geneva, Switzerland; 2005. http://apps.who.int/iris/bitstream/handle/10665/69477/WHO_SDE_PHE_OEH_06.02_eng.pdf;jsessionid=CD44465F sequence=1.
10. California Office of Environmental Health Hazard Assessment. Acute, 8-hour and Chronic Reference Exposure Level (REL) Summary. https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary. Published 2019.
11. World Health Organization. WHO Guidelines for Indoor Air Quality – Selected Pollutants. Geneva, Switzerland; 2010. http://www.euro.who.int/__data/assets/pdf_file/0009/128169/e94535.pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A06 ENHANCED VENTILATION DESIGN | O (MAX : 3 PT)

Intent : Expel internally generated pollutants and improve air quality in the breathing zone through an increased supply of outdoor air or increased ventilation efficiency.

Summary : This WELL feature requires implementation of advanced ventilation strategies that can achieve higher air quality levels 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.[1] Even with proper ventilation designed to meet ventilation standards, the concentration of indoor pollutants can exceed concentrations found in outdoor air.[2,3] Ventilation rates less than 21 cfm per person in all building types are associated with negative perception of air quality and actual health outcomes. [4]

Solutions : Scientific 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.[5,6] 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.[4] One method for decreasing the CO2 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 CO2 levels within the space.[7] Displacement ventilation improves indoor air quality, by delivering fresh outdoor air at the floor level, leaving warmer polluted indoor air, such as CO_2 to be extracted above the height of the ventilation zone.[8]

PART 1 INCREASE OUTDOOR AIR SUPPLY (MAX : 2 PT)

For All Spaces:

Option 1: Increased air supply

For mechanically ventilated buildings, the following requirement is met in all occupiable spaces:

a. Exceed outdoor air supply rates described in one of the ventilation guidelines listed in Feature A03 Part 1 by the percentages shown in the table below:

Tier	Thresholds	Points
1	30%	1
2	60%	2

OR

Option 2: Demand control ventilation

For mechanically ventilated buildlings, the following requirements are met in at least 90% of regularly occupied spaces:

a. A demand-controlled ventilation (DCV) system regulates the outdoor air ventilation rate to keep CO_2 levels less than the thresholds specified in the table below, at the maximum intended occupancy:

Tier	Threshold		Threshold	Points
1	900 ppm	OR	500 ppm above outdoor levels	1
2	750 ppm	OR	350 ppm above outdoor levels	2

b. Carbon dioxide is measured at the return air diffusers or in the breathing zone at least 3.3 ft away from doors, windows, air supply diffusers or occupants. At least one sensor is used for each occupancy zone (or per air handling unit, if a single zone is served by multiple air handling units). If the occupancy density/pattern/usage is substantially different in two adjacent areas, each area must be considered a separate zone.

OR

Option 3: Enhanced natural ventilation

For naturally ventilated buildings, the following requirement is met:

a. Implement an engineered natural ventilation system that is sufficient to keep CO_2 levels in the breathing zone of all regularly occupied spaces below the specified thresholds at the maximum intended occupancies:

Tier	Threshold		Threshold	Points
1	900 ppm	OR	500 ppm above outdoor levels	1
2	750 ppm	OR	350 ppm above outdoor levels	2

OR

Option 4: Ventilation monitoring

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.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Note : This Option is worth 2 points. Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

Note : Mixed-mode projects must select the option corresponding to the ventilation mode (mechanical and natural ventilation) in operation for the majority of operating hours within the year.

PART 2 IMPROVE VENTILATION EFFECTIVENESS (MAX : 1 PT)

For All Spaces:

Option 1: Displacement ventilation system

The project uses a displacement ventilation system in at least 90% of regularly occupied spaces, with one of the following as a basis for design:

a. ASHRAE Guidelines RP-949.[9]

b. ASHRAE 62.1-2019, "Stratified Air Distribution Systems (Section 6.2.1.2.1).[10]

c. REHVA Guidebook No. 01 (Displacement Ventilation in non-industrial premises).[11]

OR

Option 2: Personalized ventilation system

At least 50% of workstations incorporate personalized ventilation systems that meet the following requirements:

a. One of the following strategies is implemented to efficiently deliver air to occupants:
    1. Outdoor air is supplied in the breathing zone through vents incorporated into or mounted on furniture, and the return air diffusers within the space are located at least 9 ft above the floor.[10]
    2. The system's zone air distribution effectiveness (E_z) is at least 1.20.[10]

b. One of the following strategies is implemented to support thermal comfort:
    1. Outdoor air is supplied with an air speed of no greater than 50 fpm at the occupant's head.[10]
    2. The air speed from each outdoor air supply vent is individually controllable by occupants through a controller within the space, a mobile application or website.

REFERENCES

1. Allen JG, Bernstein A, Cao X, et al. The 9 Foundations of a Healthy Building. Sch Public Heal. 2017:35.

2. Parthasarathy, Srinandini, William J. Fisk TEM. Effect Of Ventilation On Chronic Health Risks In Schools And Offices. Berkeley, CA; 2013. https://eta.lbl.gov/sites/all/files/publications/lbnl-6121e.pdf.

3. Shendell DG, Winer AM, Weker R, Colome SD. Evidence of inadequate ventilation in portable classrooms: Results of a pilot study in Los Angeles County. Indoor Air. 2004;14(3):154-158. doi:10.1111/j.1600-0668.2004.00235.x

4. Seppänen OA. Association of ventilation rates and CO2concentrations with health and other responses in commercial and institutional buildings. Indoor Air. 1999;9(4):226-252. doi:10.1111/j.1600-0668.1999.00003.x

5. Wyon DP. The effects of indoor air quality on performance and productivity. Indoor Air, Suppl. 2004;14(SUPPL. 7):92-101. doi:10.1111/j.1600-0668.2004.00278.x

6. Sundell J, Levin H, Nazaroff WW, et al. Ventilation rates and health: Multidisciplinary review of the scientific literature. Indoor Air. 2011;21(3):191-204. doi:10.1111/j.1600-0668.2010.00703.x

7. U.S. Department of Energy. Demand Control Ventilation. 2012.

8. Wang Y, Kuckelkorn J, Zhao FY, Spliethoff H. Indoor environment of a classroom in a passive school building with displacement ventilation. Proc BS 2013 13th Conf Int Build Perform Simul Assoc. 2013:1902-1909.

9. American Society of Heating Refrigerating and Air-Conditioning Engineers. Performance Evaluation and Development of Design Guidelines for Displacement Ventilation, RP-949.; 1998.

10. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 62.1-2019: Ventilation for Acceptable Indoor Air Quality. 2019.

11. Skistad H, Mundt E, Nielsen P V., Hagstrom K, Railio J. Displacement Ventilation in Non-Industrial Premises. REHVA Guidebook No. 1. Rehva; 2002.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A07 OPERABLE WINDOWS | O (MAX : 2 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 buildings with operable windows to 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.

Issue : Inhalation of harmful indoor substances is correlated with adverse health outcomes, such as infectious diseases, cancer, asthma, allergies and other respiratory infections.[1,2] When outdoor air quality is favorable, opening windows can provide a supply of outdoor air and lower levels of indoor air contaminants. Achieving natural ventilation through open windows can provide a positive human experience.[3] However, it is challenging to the ability to maintain strict control over interior air quality. Despite often having conditions of temperature and ventilation below recommended standards, studies have shown that naturally ventilated buildings have fewer people reporting sick building syndrome symptoms than mechanically conditioned buildings.[4,5] In addition, studies have shown that there is a 7.7% productivity benefit associated with naturally ventilated spaces. [5,6]

Solutions : When weather and local outdoor parameters indicate high-quality outdoor air, people should be encouraged to make use of natural ventilation strategies. However, ventilating through windows generally introduces more outdoor pollution than mechanical systems with filters.[7] Human behavior is rated as one of the top three components affecting the generation and persistence of indoor air pollutants.[7] Educating and informing building users when outdoor conditions are favorable for window opening, can reduce the generation and persistence of indoor air pollutants.

PART 1 PROVIDE OPERABLE WINDOWS (MAX : 1 PT)

Note :

Projects where the average outdoor PM2.5 level is 35 µg/m^3 or higher may only achieve Part 1: Provide Operable Windows in conjunction with Part 2: Manage Window Use.

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.

Note : The World Health Organization's Global Urban Ambient Air Pollution Database may be consulted to view outdoor air quality levels, available at https://www.who.int/data/gho/data/themes/air-pollution/who-air-quality-database

PART 2 MANAGE WINDOW USE (MAX : 1 PT)

Note :

Projects may only achieve this part if Part 1 is also achieved.

For All Spaces:

1: Outdoor air measurement

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 2.5 mi of the building. This monitoring system may be operated by the project or by another entity (e.g., a government).

2: Window operation

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 15 °F of indoor air temperature setpoint.

c. Relative Humidity: 65% or lower.

REFERENCES

1. Douwes J, Thorne P, Pearce N, Heederik D. Bioaerosol health effects and exposure assessment: Progress and prospects. *Ann Occup Hyg*. 2003;47(3):187-200. doi:10.1093/annhyg/meg032
2. Selgrade MK, Plopper CG, Gilmour MI, Conolly RB, Foos BSP. Assessing the health effects and risks associated with children's inhalation exposures - Asthma and allergy. *J Toxicol Environ Heal - Part A Curr Issues*. 2008;71(3):196-207. doi:10.1080/15287390701597897
3. Brager GS. Benefits of Improving Occupant Comfort and Well-being in Buildings. In: *Proceedings of the 4th International Holcim Forum for Sustainable Construction: The Economy of Sustainable Construction*. Mumbai; 2013:181–194. https://src.lafargeholcim-foundation.org/dnl/93603859-d59e-498a-b056-405d16e39171/F13_OrangeWS_Brager.pdf.
4. Burge S, Hedge A, Wilson S, Bass JH, Robertson A. Sick building syndrome: A study of 4373 office workers.*Ann Occup Hyg*. 1987;31(4 A):493-504. doi:10.1093/annhyg/31.4A.493
5. Horr, A., Kaushik, A., Mazroei, A., Katafygiotou, A. & Elsarrag E. Occupant productivity and office indoor environment quality : a review of the literature Occupant Productivity and Office Indoor Environment Quality : A Review of the Literature. 2016. http://usir.salford.ac.uk/39106/3/BAE-D-16-

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

00533_final%2520manuscript%5B1%5D.pdf.

6. Wargocki P, Wyon DP, Fanger PO. Productivity is affected by the air quality in offices. *Proc Heal Build 2000*. 2000;1:635-640.
7. Nazaroff WW. Exploring the consequences of climate change for indoor air quality. *Environ Res Lett*. 2013. doi:10.1088/1748-9326/8/1/015022
8. American Society of Heating Refrigerating and Air-Conditioning Engineers. *ASHRAE 62.1-2010: Ventilation for Acceptable Indoor Air Quality.*; 2010.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A08 AIR QUALITY MONITORING AND AWARENESS | O (MAX : 2 PT)

Intent : Monitor indoor air quality issues, as well as inform and educate individuals on the quality of the indoor environment.

Summary : This WELL feature requires the ongoing measurement of contaminant data to educate and empower occupants about 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.[1] 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.[4]

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.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 INSTALL INDOOR AIR MONITORS (MAX : 1 PT)

For All Spaces except Dwelling Units & Guest Rooms:

1: Sensor requirements

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.

2: Reporting & maintenance

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:

1: Sensor requirements

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.

PART 2 PROMOTE AIR QUALITY AWARENESS (MAX : 1 PT)

For All Spaces:

Note : Projects may only receive points for this part, if Part 1 is also achieved

The air quality data measured in Part 1 of this feature 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 3.6–5.6 ft with at least one display per 5400 ft^2 of regularly occupied space.
    2. Hosted on a website or phone application accessible to occupants. Signs are present indicating where the data

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

may be accessed at a density of at least one sign per 5400 ft^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.

REFERENCES

1. Wallace LA, Emmerich SJ, Howard-Reed C. Source Strengths of Ultrafine and Fine Particles Due to Cooking with a Gas Stove. Environ Sci Technol. 2004;38(8):2304-2311. doi:10.1021/es0306260
2. Joshi S. The sick building syndrome. Indian J Occup Environ Med. 2008;12(2):61. doi:10.4103/0019-5278.43262
3. Selgrade MK, Plopper CG, Gilmour MI, Conolly RB, Foos BSP. Assessing the health effects and risks associated with children's inhalation exposures - Asthma and allergy. J Toxicol Environ Heal - Part A Curr Issues. 2008;71(3):196-207. doi:10.1080/15287390701597897
4. U.S. Environmental Protection Agency. Introduction to Indoor Air Quality. https://www.epa.gov/indoor-air-quality-iaq/introduction-indoor-air-quality.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A09 POLLUTION INFILTRATION MANAGEMENT | O (MAX : 2 PT)

Intent : Minimize the introduction of pollutants into indoor air through the building envelope and at building entrances.

Summary : This WELL feature requires projects to reduce transmission of air and pollutants from outdoors to indoors through the building envelope and entrance.

Issue : Research shows that approximately 65% of outdoor air particle inhalation occurs while indoors.[1] Exposure to high levels of coarse and fine particulate matter inadvertently introduced into the space can lead to respiratory irritation. It has been associated with increases in lung cancer, cardiovascular disease and mortality.[2] Indoor air quality and thermal comfort can be compromised by leaks and gaps that break the building's air barrier. These weak points are not only wasteful from an energy point of view but can also lead to conditions conducive to mold growth and to the infiltration of pests or polluted air. In addition, building users can introduce particulate matter indoors through their clothes and shoes, including harmful coliforms and *Escherichia coli*, among other toxins.[3–5]

Solutions : In addition to building envelope commissioning, there is a need for measures that minimize or prevent the introduction of potentially harmful substances into indoor spaces. An example of such interventions is the installation of entryway walk-off systems and/or entryway air seals at all main building entrances.[6]

PART 1 DESIGN HEALTHY ENTRYWAYS (MAX : 1 PT)

For All Spaces:

1: Building entry design

For any functional building entrance (not including doors to balconies or terraces), the following design features are present:

a. At least one of the following strategies are in place at entryways that span, at minimum, the width of the entrance and 10 ft long in the primary direction of travel (sum of indoor and outdoor length):[7]
    1. Grilles.
    2. Grates or slots.
    3. Rollout mats.
    4. Removable carpet tiles.
    5. Any other product designed to remove dirt from shoes at the entrance.
b. At least one of the following strategies are in place to slow the movement of air from outdoors to indoors:
    1. Building entry vestibule with two typically closed doorways.
    2. Revolving entrance doors.
    3. Buildings with an entrance that is outside of the project boundary, or buildings with an entrance lobby that is not regularly occupied, must have at least three typically shut doors that separate the outdoors from all regularly occupied spaces within the project boundary.
    4. Air curtains installed and commissioned in accordance with ASHRAE Standard 90.1-2019.

2: Building entry maintenance

Building entryway systems are cleaned, as follows:

a. Wet-cleaned at least once a week, or as instructed by manufacturer.
b. Vacuumed at least once a day, or as instructed by manufacturer.

For Outdoor Sport Areas:

The following requirement is met:

a. All facilities adjacent to an outdoor sports field have an area (e.g., staging area, mudroom, drying room) that separates the playing field from other internal areas to capture moisture and debris.

Note :
Interiors projects may count exterior building entrances that meet the feature requirements, even if they are outside of the project boundary.

PART 2 PERFORM ENVELOPE COMMISSIONING (MAX : 1 PT)

For All Spaces:

For projects undergoing design and construction, the following requirements are met:

a. The project uses a façade engineer that is responsible for defining the building envelope performance metrics (including materials, components, assemblies and systems) at the concept design stage.
b. The building envelope performance requirements are included in the Basis of Design document and reflect the Owner's Project Requirements.
c. The commissioning process includes envelope commissioning for air infiltration and leakage, which is reflected in the specification and commissioning plan.
d. The envelope commissioning process is executed, as outlined in the commissioning plan.
e. The envelope commissioning plan is included in the project Operation & Maintenance (O&M) Manual.

Note :

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Interiors projects may count commissioning performed on the building envelope, even if outside of the project boundary.

REFERENCES

1. Fisk WJ. Review of some effects of climate change on indoor environmental quality and health and associated no-regrets mitigation measures. Build Environ. 2015;86(January):70-80. doi:10.1016/j.buildenv.2014.12.024
2. Du Y, Xu X, Chu M, Guo Y, Wang J. Air particulate matter and cardiovascular disease: The epidemiological, biomedical and clinical evidence. J Thorac Dis. 2016;8(1):E8-E19. doi:10.3978/j.issn.2072-1439.2015.11.37
3. Licina D, Tian Y, Nazaroff WW. Emission rates and the personal cloud effect associated with particle release from the perihuman environment. Indoor Air. 2017;27(4):791-802. doi:10.1111/ina.12365
4. Lax S, Hampton-Marcell JT, Gibbons SM, et al. Forensic analysis of the microbiome of phones and shoes. Microbiome. 2015;3(1):21. doi:10.1186/s40168-015-0082-9
5. Licina D, Nazaroff WW. Clothing as a transport vector for airborne particles: Chamber study. Indoor Air. 2018;28(3):404-414. doi:10.1111/ina.12452
6. Younes C, Shdid CA, Bitsuamlak G. Air infiltration through building envelopes: A review. J Build Phys. 2012;35(3):267-302. doi:10.1177/1744259111423085
7. U.S. Green Building Council. LEED BD+C: New Construction | v4 - LEED v4. 2018. https://www.usgbc.org/sites/default/files/LEED v4 BDC_07.2.18_current.pdf.
8. Wenger Corporation. Planning your athletic facility. https://www.wengercorp.com/Construct/docs/Athletic Planning Guide by Wenger GearBoss.pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A10 COMBUSTION MINIMIZATION | O (MAX : 1 PT)

Intent : Reduce human exposure to combustion-related air pollution from heating and transportation sources.

Summary : This WELL feature requires projects to utilize low-emission combustion products or eliminate combustion-based products entirely.

Issue : Combustion-related emissions, mostly from space heating, cooking and nearby transportation, are often a major and overlooked source of indoor air pollution.[1] Inefficient heating practices, cooking or other combustion activities produce high levels of indoor air pollution that include a range of health-damaging pollutants, such as fine particles, nitrogen dioxide and carbon monoxide.[2] In addition to nausea, loss of consciousness and death[3], inhalation of elevated levels of carbon monoxide is linked to headaches, visual impairment, reduced cognitive functioning and the ability to perform complex tasks[4].

Solutions : Opting for non-combustion or low-emission combustion products is an important first step toward the reduction of carbon monoxide, nitrogen dioxide, small particles and other combustion by-products in the air.[5]

PART 1 MANAGE COMBUSTION (MAX : 1 PT)

For All Spaces except Commercial Kitchen Spaces:

1: Appliance and heater combustion ban

The following requirements are met for combustion-based fireplaces, stoves, space heaters, ranges and ovens:

a. Are not used in indoors.[6]

b. If located outdoors, only use natural gas / propane and are located at least 10 ft from the building.[8]

2: Low-emission combustion sources

Equipment used by the project for heating, cooling, water heating, process heating or power generation (including back-up, if used for more than 200 hours per year) meets one or more of the following requirements:

a. Comply with California's South Coast Air Quality Management District emission rules for pollution.[7]

b. Are electric.

c. Are supplied by district heating or cooling.

3: Engine exhaust reduction

The following requirement is met:

a. Vehicle engine idling for more than 30 seconds is prohibited in all pick-up, drop-off and parking areas at the building site controlled by the project. "No idling" signage is present at these locations indicating this rule.

REFERENCES

1. Liu J, Mauzerall DL, Chen Q, et al. Air pollutant emissions from Chinese households: A major and underappreciated ambient pollution source. Proc Natl Acad Sci. 2016;113(28):7756-7761. doi:10.1073/pnas.1604537113
2. World Health Organization. Household (Indoor) Air Pollution. http://www.who.int/airpollution/household/en/. Published 2016.
3. Weaver LK, Hopkins RO, Chan KJ, et al. Hyperbaric Oxygen for Acute Carbon Monoxide Poisoning. N Engl J Med. 2002;347(14):1057-1067. doi:10.1056/NEJMoa013121
4. Centers for Disease Control and Prevention. Carbom Monoxide Poisoning. https://ephtracking.cdc.gov/showCoRisk.action.
5. Bruce N, Pope D, Rehfuess E, Balakrishnan K, Adair-Rohani H, Dora C. WHO indoor air quality guidelines on household fuel combustion: Strategy implications of new evidence on interventions and exposure-risk functions. Atmos Environ. 2015;106:451-457. doi:10.1016/j.atmosenv.2014.08.064
6. U.S. Environmental Protection Agency. How can you protect your heart from air pollution? https://www.epa.gov/sciencematters/how-can-you-protect-your-heart-air-pollution. Published 2018.
7. South Coast Air Quality Management District. SCAMD Rules and Regulations, Regulation XI - Source Specific Standards. http://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/regulation-xi.
8. State of California. California Building Standards Code 2019 Title 24, Part 9, California Fire Code – Section 307 Open Burning, Recreational Fires and Portable Outdoor Fireplaces. https://www.dgs.ca.gov/BSC/Codes. Published 2019.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A11 SOURCE SEPARATION | O (MAX : 1 PT)

Intent : Preserve indoor air quality and maximize olfactory comfort in occupied spaces through the isolation and proper ventilation of indoor pollution sources and chemical storage areas.

Summary : This WELL feature requires strategies that isolate key sources of odors, germs, pollution or humidity through doors or dedicated exhaust.

Issue : Air pollution can be created from many indoor sources, including cleaning products, office equipment and humid environments. Chemical storage closets that house cleaning products, can be a source of harmful vapors, including Volatile Organic Compounds (VOCs) that are linked to cancer, organ and central nervous system damage.[1,2] Copy rooms can contribute to the production of ozone, which has been associated with lung inflammation, chest pain, wheezing, coughing, shortness of breath and the exacerbation of respiratory illnesses, such as pneumonia and asthma.[3–5] Bathrooms can encourage the growth of mold and mildew, which have been associated with allergic reactions and aggravate lung diseases, such as asthma.[6] Exposure to air pollutants in kitchens, such as particulate matter, VOCs and polycyclic aromatic hydrocarbons, has been associated with kidney inflammation.[7]

Solutions : The most effective way to curb air pollution in buildings is to eliminate individual sources or capture emissions at the source, before they spread to surroundings.[8] For air pollution sources that are inevitable, physical separation of such sources combined with direct ventilation exhaust systems is an effective means of protecting individuals.

PART 1 MANAGE POLLUTION AND EXHAUST (MAX : 1 PT)

For All Spaces except Dwelling Units & Guest Rooms:

For all bathrooms, kitchens, rooms for cleaning and chemical storage, rooms with high-volume printers and copiers and high-humidity areas, the following requirements are met:

a. Meet one of the following:
    1. Are separated from all adjacent regularly occupied spaces with self-closing doors and/or vestibules.
    2. Are negatively pressurized compared with adjacent regularly occupied spaces.
b. Utilize exhaust fans such that the return air is vented outdoors and not recirculated.[9,10]

For Commercial Kitchen Spaces:

Option 1: Control cooking pollution

The following requirements are met:

a. Canopy hoods have side or partial panels, when allowable by code.[11]
b. Type II hood overhangs and setbacks comply with ASHRAE 154-2011.[12]
c. The vertical distance between the front lower lip of the hood and the cooking surface is less than or equal to 4 ft.[12]
d. Replacement air velocity near (or directed at) the hood is less than 75 fpm.[11]
e. Replacement air introduced directly into the exhaust hood cavity does not exceed 10% of the hood exhaust airflow rate.[13]
f. Appliances are grouped under exhaust hoods according to effluent production and associated ventilation requirements, as specified in ASHRAE 154-2011, per hood type (defined by the classifications used in ASHRAE 154-2011 for light, medium, heavy and extra-heavy appliance duty levels).[12]
g. Appliances have a rear seal between the appliance and the wall, when allowable by code.[15]
h. Appliances located at the end of a cook line requiring exhaust airflow rates greater than 300 cfm/ft have a full side panel or an end wall.[12]

OR

Option 2: No applicable commercial appliances

The following requirements are met:

a. There are no appliances that require a hood, as specified in ASHRAE 154-2011 (Table 2 - Type I Hood Requirements by Appliance Type, Table 2 - Type II Hood Requirements by Appliance Description).[12]

For Dwelling Units & Guest Rooms:

The following requirements are met:

a. Where cooking burners and stove top cooking appliances are present, a range hood meets the following:
    1. Exhaust air is vented directly to the outdoors.[16]
    2. Exhaust air outlets are separated from any air intakes by at least 10 ft, unless otherwise specified by local code.[17]
    3. The minimum operating exhaust airflow rate is the greater of 100 cfm per linear foot of range hood width or 200 cfm.[18]
    4. The range hood device, when in operation, covers at least 75% of the burner area.[19]
b. All bathrooms contain one of the following:
    1. Exhaust fan.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

2. Operable window.

REFERENCES

1. Nurmatov UB, Tagiyeva N, Semple S, Devereux G, Sheikh A. Volatile organic compounds and risk of asthma and allergy: A systematic review. Eur Respir Rev. 2015;24(135):92-101. doi:10.1183/09059180.00000714
2. U.S. Environmental Protection Agency. Volatile Organic Compounds' Impact on Indoor Air Quality. https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality.
3. U.S. Environmental Protection Agency. Health Effects of Ozone in Patients with Asthma and Other Chronic Respiratory Disease. https://www.epa.gov/ozone-pollution-and-your-patients-health/health-effects-ozone-patients-asthma-and-other-chronic.
4. The National Institute of Environmental Health Sciences. Ozone. https://www.niehs.nih.gov/health/topics/agents/ozone/index.cfm. Published 2008.
5. Tuomi T, Engstrom B, Niemela R, Svinhufvud J, Reijula K. Emission of ozone and organic volatiles from a selection of laser printers and photocopiers. Appl Occup Environ Hyg. 2000;15(8):629-634. doi:10.1080/10473220050075635
6. Mendell MJ, Mirer AG, Cheung K, Tong M, Douwes J. Respiratory and allergic health effects of dampness, mold, and dampness-related agents: A review of the epidemiologic evidence. Environ Health Perspect. 2011;119(6):748-756. doi:10.1289/ehp.1002410
7. Singh A, Kamal R, Mudiam MKR, et al. Heat and PAHs emissions in indoor kitchen air and its impact on kidney dysfunctions among kitchen workers in Lucknow, North India. Jia Z, ed. PLoS One. 2016;11(2):e0148641. doi:10.1371/journal.pone.0148641
8. U.S. Environmental Protection Agency. Improving Indoor Air Quality. https://www.epa.gov/indoor-air-quality-iaq/improving-indoor-air-quality.
9. U.S. Green Building Council. LEED BD+C: New Construction | v4 - LEED v4. 2018. https://www.usgbc.org/sites/default/files/LEED v4 BDC_07.2.18_current.pdf.
10. Wenger Corporation. Planning your athletic facility. https://www.wengercorp.com/Construct/docs/Athletic Planning Guide by Wenger GearBoss.pdf.
11. California Energy Commission. Design Guide Improving Commercial Kitchen Ventilation System Performance.; 2003. http://www.energy.ca.gov/reports/2003-06-13_500-03-034F.PDF.
12. International Codes Council. 2015 Minnesota Mechanical and Fuel Gas Code with the ANSI/ASHRAE Standard 154-2011. Presented at the: 2015. https://codes.iccsafe.org/public/document/MMFGC2015/copyright.
13. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 90.1: Energy Standard for Buildings Except Low-Rise Residential Buildings.; 2010. http://www.usailighting.com/stuff/contentmgr/files/1/b90ce247855d0f17438484c003877338/misc/ashrae_90_1_2(
14. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 189.1: Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings.; 2011. http://www.ditar.cl/archivos/Normas_ASHRAE/T1160ASHRAE-189.1-2009-Design-H-P-Green-Buildings.pdf.
15. Sobiski P, Swierczyna R, Fisher D. Effects of Range Top Diversity, Range Accessories, and Hood Dimensions on Commercial Kitchen Hood Performance. Vol 112 PART 1. San Francisco, CA; 2006.
16. Militello-Hourigan RE, Miller SL. The impacts of cooking and an assessment of indoor air quality in Colorado passive and tightly constructed homes. Build Environ. 2018. doi:10.1016/j.buildenv.2018.08.044
17. American Society of Heating Refrigerating and Air Conditioning Engineers (ASHRAE). ASHRAE 154-2003: Ventilation for Commercial Cooking Operations. 2003. http://sspc154.ashraepcs.org/pdf/STD154_2003.pdf.
18. Home Ventilating Institute. What is a range hood? https://www.hvi.org/HVIORG/document-server/?cfp=HVIORG/assets/File/public/publications/HVIRangeHood_4Feb08.pdf.
19. Singer BC, Delp WW, Apte MG. Experimental evaluation of installed cooking exhaust fan performance. Ernest Orlando Lawrence Berkeley Natl Lab. 2012.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A12 AIR FILTRATION | O (MAX : 1 PT)

Intent : Reduce indoor and outdoor airborne contaminants through air filtration.

Summary : This WELL feature requires projects with mechanically ventilated spaces to implement adequate air filtration and document a maintenance protocol for installed filters.

Issue : Exposure to particulate matter (PM) is associated with many negative health outcomes. PM_{10} can block and inflame airways, causing a range of respiratory-related conditions that can lead to illness or death.[1] $PM_{2.5}$ poses even greater health risks compared to $PM_{10,}$ because it can penetrate deep into the lungs, enter the bloodstream and as a result, cause a variety of health issues, including heart disease and other cardiovascular complications.[1]

Solutions : Selection and installation of adequate media filters is one of the key mechanisms for minimizing exposure to outdoor and indoor air pollution. Studies have shown that decreased exposure to particulate matter by filtration of recirculated indoor air is associated with a reduced risk of cardiovascular disease and is an effective control measure for reducing allergic respiratory disease.[2,3] In addition, regular filter maintenance is critical to ensure proper air filtration and the efficiency of the air conditioning system. During the operation, filters should be replaced when they become loaded with particles, since they will begin to reduce airflow and increase pressure drop. Overloaded filters not only restrict airflow rate but can also result in a loss of filtration efficiency. It is also critical for projects to be aware whether the building is located in an area with elevated outdoor air pollution, since these projects often need to install a pre-filtration stage, in addition to the primary filtration, to maintain high-quality indoor air.[4]

PART 1 IMPLEMENT PARTICLE FILTRATION (MAX : 1 PT)

For All Spaces:

1: Filtration levels

The following requirement is met:

a. Media filters are used in the ventilation system to filter outdoor air supplied to the space, in accordance with thresholds specified in the table below:[5,6]

Annual Average Outdoor $PM_{2.5}$ Threshold	Average Air Filtration Efficiency (particles 0.3-1 µm)
23 µg/m^3 or less	≥ 35% (e.g., MERV 12 or M6)
24–39 µg/m^3	≥ 75% (e.g., MERV 14, F8 or ePM1 75%)
40 µg/m^3 or greater	≥ 95% (e.g., MERV 16, E10 or ePM1 95%)

2: Filter maintenance

The following requirement is met:

a. Evidence that the filter has been replaced according to the manufacturer's recommendation is submitted annually through the WELL digital platform.

Note :

The World Health Organization's Global Urban Ambient Air Pollution Database may be consulted to view outdoor air quality levels, available at https://www.who.int/data/gho/data/themes/air-pollution/who-air-quality-database

REFERENCES

1. World Health Organization. Health Effects of Particulate Matter: Policy Implications for Countries in Eastern Europe, Caucasus and Central Asia. Geneva, Switzerland http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/publications/2013/health-effects-of-particulate-matter.-policy-implications-for-countries-in-eastern-europe,-caucasus-and-central-asia-2013.
2. Bräuner EV, Forchhammer L, Møller P, et al. Indoor particles affect vascular function in the aged: An air filtration-based intervention study. Am J Respir Crit Care Med. 2008;177(4):419-425. doi:10.1164/rccm.200704-632OC
3. Sublett JL. Effectiveness of air filters and air cleaners in allergic respiratory diseases: A review of the recent literature. Curr Allergy Asthma Rep. 2011;11(5):395-402. doi:10.1007/s11882-011-0208-5
4. Centers for Disease Control and Prevention. Filtration and Air-Cleaning Systems to Protect Building Environments from Airborne Chemical, Biological, or Radiological Attacks. https://www.cdc.gov/niosh/docs/2003-136/default.html. Published 2003.
5. Stephens B, Brennan T, Harriman L. Selecting Ventilation Air Filters to Reduce PM 2.5 Of Outdoor Origin. ASHRAE J. 2016. http://www.conforlab.com.br/wp-content/uploads/2016/10/2016Sep_012-021_HarrimanFiltersToReducePM2.5.pdf.
6. Camfil. Comparison Chart ASHRAE 52.2, 52.1, EN779, EN1882. https://www.camfil.com/FileArchive/Industries/Gas turbines and other power systems/Filter brochures/Filter_class_chart_ASHRAE_EN2012.pdf. Accessed April 1, 2018.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A13 ENHANCED SUPPLY AIR | O (MAX : 3 PT)

Intent : Mitigate risks from indoor contamination and pollution sources, such as infectious disease particles and volatile organic compounds (VOC).

Summary : This WELL feature requires the projects to use supply air that is not recirculated or that is treated with carbon filters, media filters and/or Ultraviolet Germicidal Irradiation (UVGI).

Issue : Building materials, furnishings (e.g., carpets and furniture finishes), fabrics, cleaning products, personal care products, adhesives, solvents and air fresheners can all emit VOCs or semi-volatile organic compounds (SVOCs) into the indoor environment.[1,2] VOCs include benzene, formaldehyde and other chemical compounds which, at high concentrations, can lead to the irritation of the nose and pharynx and have been associated with leukemia and nasopharyngeal cancer.[3,4] Health effects can also include damage to the liver, kidneys and central nervous system.[5] When humans exhale, they can release pathogens, such as COVID-19 or Influenza particles, which can remain suspended in the air for several hours or longer. These pathogens can be recirculated through ducts and HVAC systems of buildings, increasing the risk of transmission of disease indoors.[6–8]

Solutions : The simplest way to avoid recirculating contaminated air is to not recirculate it by supplying spaces with 100% outdoor air. Unfortunately, in certain climates this can result in high energy usage, although this can be mitigated through the use of heat recovery systems.[9] In buildings where recirculated air is utilized, it can be treated to remove contaminants. Carbon is capable of filtering VOCs and ozone from the air that passes through[10,11]. HEPA or near-HEPA filters can help remove virus particles, since the virus often travels as an attachment to a larger particle.[12,13] UVGI systems can also be effective, both when irradiating the upper portion of the room or when installed in the air ducts, so long as they are powerful and/or the air speed is slow enough to provide a sufficient UV dose.[13,14] Other technologies exist, but should be evaluated carefully. For example, more novel devices that release oxidants into rooms have less robust evidence for safety and efficacy outside of laboratory conditions.[15,16] Finally, in-room air purifiers can be beneficial because the clean air is often provided within the breathing zone. For optimal performance, air filtration systems need to be maintained according to the manufacturer's instructions.

PART 1 IMPROVE SUPPLY AIR (MAX : 1 PT)

For All Spaces:

Option 1: 100% Outdoor air provisions

The following requirements are met:

a. Each regularly occupied space is ventilated with outdoor air that has not recirculated from other rooms within the building.

OR

Option 2: Cleaning and purification devices

All regularly occupied spaces with recirculated air are treated with purification/cleaning system(s), either in the HVAC system or as a standalone device, which meet the following requirements:

a. Use, at a minimum, two of the following air purification/cleaning technologies:
    1. Activated carbon filter.
    2. Media filter with an average removal efficiency of ≥75% for particles 0.3-1 µm in size (e.g., MERV 14; F8; ePM1 75%).
    3. UVGI to treat the moving air OR upper-room UVGI.
b. Comply with one of the following:
    1. Are validated under UL 2998 Zero Ozone Emissions Validation or Intertek Zero Ozone Verification.[15]
    2. Do not use electronic air cleaners.
c. Are not designed to release ions, reactants, or other molecules into occupiable spaces to disinfect or clean the air.[16]
d. Are sized appropriately to the room volume or area, based on manufacturer specifications.
e. Are maintained according to the manufacturer's recommendations. Documentation of maintenance is submitted annually through the WELL digital platform.

PART 2 B PROVIDE CLEAN AIRFLOW RATES FOR CONTROL OF INFECTIOUS AEROSOLS (MAX : 2 PT)

For All Spaces:

Option 1: Regular Airflow Operation

The mechanical system provides all regularly occupied spaces with clean airflow rates for infection risk management as set in one of the following guidelines:

a. ASHRAE 241-2023 Table 5-1 Equivalent Clean Airflow Rates (Section 6 - Clean Airflow Rate Equation or Appendix C - In-place Modeling Method).[17]
b. 5 Equivalent Air Changes per hour (5 e/ACH) calculated in accordance with Appendix A1.[18]

OR

Option 2: Operation Under Infectious Disease Management Mode

The following requirements are met:

a. The mechanical system is capable of providing all regularly occupied spaces with clean airflow rates for infection risk management as set in one of the following guidelines:
    1. ASHRAE 241-2023 Table 5-1 Equivalent Clean Airflow Rates (Section 6 - Clean Airflow Rate Equation or Appendix C - In-place Modeling Method).[17]
    2. 5 Equivalent Air Changes per hour (5 e/ACH) calculated in accordance with Appendix A1.[18]

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

b. The project has an operational plan for Infection Risk Management Mode (IRMM) that includes the following:[17]

1. The conditions under which the IRMM will be activated.
2. The engineering controls (e.g., changes in ventilation or air treatment) and non-engineering controls (e.g., changes in occupancy) that will be utilized to achieve the target clean airflow rates.
3. The operational and maintenance procedures in place to implement target clean airflow rates within 48-hours of the decision to activate IRMM.
4. An inventory of HVAC system consumables (e.g., filters, adsorption media, UV bulbs) that is updated when significant equipment modifications have been implemented or after replacement consumables have been utilized.
5. A requirement that there is at least one set of replacement consumables available to install during IRMM.

Note :
This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. Salthammer T. Emissions of Volatile Organic Compounds from Products and Materials in Indoor Environments. Handb Environ Chem. 2004;4:37-71. doi:10.1007/b94830
2. Wallace LA, Pellizzari E, Leaderer B, Zelon H, Sheldon L. Emissions of volatile organic compounds from building materials and consumer products. Atmos Environ. 1987;21(2):385-393. doi:10.1016/0004-6981(87)90017-5
3. Nurmatov UB, Tagiyeva N, Semple S, Devereux G, Sheikh A. Volatile organic compounds and risk of asthma and allergy: A systematic review. Eur Respir Rev. 2015;24(135):92-101. doi:10.1183/09059180.00000714
4. Nielsen GD, Larsen ST, Wolkoff P. Re-evaluation of the WHO (2010) formaldehyde indoor air quality guideline for cancer risk assessment. Arch Toxicol. 2017;91(1):35-61. doi:10.1007/s00204-016-1733-8
5. U.S. Environmental Protection Agency. Volatile Organic Compounds' Impact on Indoor Air Quality. https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality.
6. Stariolo DA. COVID-19 in Air Suspensions.; 2020. https://arxiv.org/abs/2004.05699. Accessed June 15, 2020.
7. Federation of European Heating Ventilation and Air-Conditioning Associations. How to operate and use building services in order to prevent the spread of the coronavirus disease (COVID-19) virus (SARS-CoV-2) in workplaces. 2020.
8. Dietz L, Horve PF, Coil DA, Fretz M, Eisen JA, Van Den Wymelenberg K. 2019 Novel Coronavirus (COVID-19) Pandemic: Built Environment Considerations To Reduce Transmission. Gilbert JA, ed. mSystems. 2020;5(2):e00245-20. doi:10.1128/mSystems.00245-20
9. Zemitis J, Borodinecs A. Energy saving potential of ventilation systems with exhaust air heat recovery. IOP Conf Ser Mater Sci Eng. 2019;660:012019. doi:10.1088/1757-899X/660/1/012019
10. Fisk WJ, Spears M, Sullivan DP, Mendell M. Ozone Removal by Filters Containing Activated Carbon: A Pilot Study.; 2009. https://www.osti.gov/scitech/servlets/purl/1050670/.
11. Sekine Y, Fukuda M, Takao Y, Ozano T, Sakuramoto H, Wang KW. Simultaneous removal of formaldehyde and benzene in indoor air with a combination of sorption- and decomposition-type air filters. Environ Technol. 2011;33(15-16):1983-1989. doi:10.1080/09593330.2011.562924
12. Liu Y, Ning Z, Chen Y, et al. Aerodynamic analysis of SARS-CoV-2 in two Wuhan hospitals. Nature. 2020. doi:10.1038/s41586-020-2271-3
13. The American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE Position Document on Infectious Aerosols. 2020.
14. Yang Y, Zhang H, Nunayon SS, Chan V, Lai AC. Disinfection efficacy of ultraviolet germicidal irradiation on airborne bacteria in ventilation ducts. Indoor Air. 2018;28(6):806-817. doi:10.1111/ina.12504
15. U.S. Environmental Protection Agency. Air Cleaners, HVAC Filters, and Coronavirus (COVID-19). Accessed: October 7, 2022. Reference
16. ASHRAE. ASHRAE Position Document on Filtration and Air Cleaning. Published: 2015. Reference
17. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 241-2023: Control of Infectious Aerosols.; 2023.
18. Centers for Disease Control and Prevention. How Much Ventilation is Enough? Reference.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

A14 MICROBE AND MOLD CONTROL | O (MAX : 1 PT)

Intent : Reduce mold and bacteria growth within the building mechanical system.

Summary : This WELL feature requires projects to utilize UVGI systems and/or conduct regular inspections on components of the cooling system to reduce or eliminate growth of microbes and mold.

Issue : Mold will grow in places with an acceptable temperature range, a nutrient source and sufficient moisture.[1] Air conditioner systems, specifically cooling coils, have high levels of moisture condensation and serve as the perfect breeding grounds for mold.[2] Mold developed on cooling coils may shed particles into the building's indoor air and trigger asthma, headaches, allergies and other respiratory system disorders.[3–6] Exposure to mold has also been associated with hypersensitivity pneumonitis, allergic rhinitis, bronchitis, lung tumor development, eczema and toxic mold syndrome.[5,7]

Solutions : The growth of microorganisms and mold can be prevented and mitigated through a combination of regular mold inspections and placement of microbe inactivation techniques, such as Ultraviolet Germicidal Irradiation (UVGI) systems. Periodic inspections and maintenance of cooling systems are good preventative methods to reduce system failures that contribute to an increased potential for mold proliferation. Expenses associated with proper maintenance will often offset typical costs associated with mold remediation.[1] UVGI has been shown to dramatically reduce mold and bacteria growth on cooling coils and destroy microbial films that accumulate on their surfaces.[8] Studies have also associated the implementation of UVGI systems with a simultaneous reduction in viable microorganisms and respiratory disorders in the workplace.[9]

PART 1 IMPLEMENT ULTRAVIOLET TREATMENT FOR HVAC SURFACES (MAX : 1 PT)

For All Spaces:

1: UV system design

The following requirements are met:

a. All central air handling units use ultraviolet lamps to irradiate the surfaces of the cooling coils and drain pans.[10]

b. All cooling coils and drain pans not associated with central air handling units (e.g., those used in fan coil units or supplementary air handling units) either:

   1. Are irradiated by ultraviolet lamps.
   2. May be opened for inspection for mold growth and cleaned, if necessary.

2: UV system maintenance and inspection

The following requirements are met:

a. Evidence that the ultraviolet lamps have been replaced or maintained, according to manufacturer's recommendation is submitted annually through the WELL digital platform.

b. All cooling coils without ultraviolet lamps (if applicable) are inspected on a quarterly basis for mold growth and cleaned if necessary. Dated photos demonstrating adherence are submitted annually through the WELL digital platform.

REFERENCES

1. Air Conditioning Heating & Refrigeration News. Reducing Mold Growth in HVAC Equipment. https://www.enviro-tec.com/pdf/catalog/WP-ReducingMoldGrowth.pdf. Published 2003.
2. Fink R. Mold/Bacteria Protection of A/C Coil. ACHR News. https://www.achrnews.com/articles/106240-mold-bacteria-protection-of-a-c-coil. Published 2008.
3. Zock J-P, Jarvis D, Luczynska C, Sunyer J, Burney P, European Community Respiratory Health Survey. Housing characteristics, reported mold exposure, and asthma in the European Community Respiratory Health Survey. J Allergy Clin Immunol. 2002;110(2):285-292. https://www.jacionline.org/article/S0091-6749(02)00092-1/pdf.
4. Mendell MJ, Mirer AG, Cheung K, Tong M, Douwes J. Respiratory and allergic health effects of dampness, mold, and dampness-related agents: A review of the epidemiologic evidence. Environ Health Perspect. 2011;119(6):748-756. doi:10.1289/ehp.1002410
5. Fisk WJ, Eliseeva EA, Mendell MJ. Association of residential dampness and mold with respiratory tract infections and bronchitis: A meta-analysis. Environ Heal A Glob Access Sci Source. 2010;9(1):72. doi:10.1186/1476-069X-9-72
6. Jones R, Recer GM, Hwang SA, Lin S. Association between indoor mold and asthma among children in Buffalo, New York. Indoor Air. 2011;21(2):156-164. doi:10.1111/j.1600-0668.2010.00692.x
7. Pettigrew HD, Selmi CF, Teuber SS, Gershwin ME. Mold and human health: Separating the wheat from the chaff. Clin Rev Allergy Immunol. 2010;38(2-3):148-155. doi:10.1007/s12016-009-8175-5
8. Berkeyley Lab, LBNL Indoor Environment Group. Using Ultraviolet Germicidal Lights for Air Cleaning. https://iaqscience.lbl.gov/air-uv.
9. Dick Menzies, Julia Popa, James A Hanley, Thomas Rand DKM. Effect of Ultraviolet Germicidal Lights Installed in Office Ventilation Systems on Workers' Health and Wellbeing: Double-Blind Multiple Crossover Trial.
10. The American Society of Heating Refrigerating and Air-Conditioning Engineers. Standard 185.2-2014 -- Method of Testing Ultraviolet Lamps for Use in HVAC&R Units or Air Ducts to Inactivate Microorganisms on Irradiated Surfaces.; 2014. https://www.techstreet.com/standards/ashrae-185-2-2014?product_id=1881838.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

APPENDIX A1:

eACH = Q / [room volume][18]

Where Q = A + B + C + D (total clean volumetric air flow rate)

To determine the total clean volumetric air flow rate (Q) for a room, sum the air flow rates for individual systems (as applicable to the HVAC system) per the calculations below.

A: Ventilation Systems[18]

The greater of:

- The full mechanical HVAC outdoor air supply rate
- The full mechanical HVAC system's exhaust rate, provided the transfer air is from non-regularly occupied spaces or outdoors

B: CADR-rated Media Filters (Standalone Systems)[17,18]

One of the following:

- The full m-CADR rate (AHAM Certified per ANSI/AHAM Standard AC-5) or, if unavailable,
- The full smoke-CADR rate (AHAM Certified per ANSI/AHAM Standard AC-1)

C: In-duct or non CADR-rated Media Filters[18]

Multiply the air supply rate (e.g., mechanical HVAC fan, blower fan) by the weighted clean air below:

MERV-A (ASHRAE 52.2)	ePM2.5 (ISO 16890)	Weighted Clean Air Factor (MERV E2 [1-3 um] minimum arrestance efficiency)
< 13	≤ 79	0
13	80	85
14-15	85	90
16	90	95
17-19 (HEPA	99	99

D: In-duct UVGI[17]

Multiply the air supply rate by the infectious aerosol reduction efficiency determined in accordance with ANSI/ASHRAE 185.1 with MS2 challenge organism.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

WATER

The WELL Water concept covers aspects of the quality, distribution and control of liquid water in a building. It includes features that address the availability and contaminant thresholds of drinking water, as well as features targeting the management of water to avoid damage to building materials and environmental conditions.

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.[1] Water is the medium for the transport of nutrients and waste throughout the body and helps to regulate the internal body temperature.[1] Depending on age, sex and pregnancy status, guidelines for water intake (including water in foods as well as direct consumption) recommend values between 49-125 oz daily water consumption by adults.[1,2] 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.[2] However, many people are inadequately hydrated, even where safe water is usually at the tap.[3-5] One contributing factor to this 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.[6]

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.[7] However, there has been increasing risk from industrial, agricultural and pharmaceutical sources. For example, water with high levels of nitrate can impair oxygen transport in infants and lead exposure can impair neurodevelopment in children.[8] 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)[9]. 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.[8] Only then is it possible to design water treatment systems which address the necessary contaminants without adding undue complexity and wastewater.

In addition to providing hydration for building users, water plays a large role in other aspects of building design and operation. It is frequently used in heating and cooling systems, irrigation, pools and baths and general appliances. These instances are associated with various concerns for contamination, such as the need to control Legionella in cooling systems and hot tubs.[10] Additionally, if water from any source wets building materials that are not intended to come into contact with water, it sets up prime conditions for mold growth.[11] Careful building design that integrates responsive operations and allows for easy and meaningful means of inspection can mitigate the risks from water in these other aspects of buildings.

Universal access to good water, sanitation and hygiene are often grouped in public health approaches[12] yet are interdependent of each other. Provision of well-designed and equipped bathrooms for all, supporting appropriate hand washing, should reduce risks of acquiring enteric and respiratory diseases associated with poor hygiene practices.[12-14]

The WELL Water concept aims to increase the rate of adequate hydration in building users, reduce health risks due to contaminated water and excessive moisture within buildings and provide adequate sanitation through better infrastructure design and operations coupled with awareness and maintenance of water quality.

Note : Read more about the evidence behind the WELL Water Concept. Note: Material from the research digests is not covered on the WELL AP exam.

REFERENCES

1. Institute of Medicine. Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate. Washington, DC: The National Academies Press; 2005.
2. European Food Safety Authority. Dietary Reference Values for nutrients Summary report. EFSA Supporting Publications. 2017;14(12):e15121E.
3. Kenney EL, Long MW, Cradock AL, Gortmaker SL. Prevalence of Inadequate Hydration Among US Children and Disparities by Gender and Race/Ethnicity: National Health and Nutrition Examination Survey, 2009–2012. American Journal of Public Health. 2015;105(8):e113-e118.
4. Malisova O, Athanasatou A, Pepa A, et al. Water Intake and Hydration Indices in Healthy European Adults: The European Hydration Research Study (EHRS). Nutrients. 2016;8(4).
5. Sui Z, Zheng M, Zhang M, Rangan A. Water and Beverage Consumption: Analysis of the Australian 2011-2012 National Nutrition and Physical Activity Survey. Nutrients. 2016;8(11).

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

6. Onufrak SJ, Park S, Sharkey JR, Sherry B. The relationship of perceptions of tap water safety with intake of sugar-sweetened beverages and plain water among US adults. Public Health Nutrition. 2014;17(1):179-185.
7. US Centers for Disease Control & Prevention. Ten Great Public Health Achievements—United States, 1900-1999. JAMA. 1999;281(16):1481-1481.
8. World Health Organization. Guidelines for drinking-water quality. 4th ed. Geneva, Switzerland: WHO Press; 2017.
9. World Health Organization. Trihalomethanes in Drinking-water. Geneva, Switzerland2005.
10. US Centers for Disease Control & Prevention. Legionella (Legionnaires' Disease and Pontiac Fever). https://www.cdc.gov/legionella/index.html. Published 2019. Updated April 30, 2018. Accessed December 20, 2019.
11. World Health Organization. WHO guidelines for indoor air quality: dampness and mould. 2009.
12. UNICEF. Water, Sanitation and Hygiene. https://www.unicef.org/wash/. Published 2016. Accessed June 6, 2020.
13. Luby SP, Agboatwalla M, Painter J, Altaf A, Billhimer WL, Hoekstra RM. Effect of intensive handwashing promotion on childhood diarrhea in high-risk communities in Pakistan: a randomized controlled trial. JAMA. 2004;291(21):2547-2554.
14. World Health Organization. Coronavirus disease (COVID-19) advice for the public. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public. Published 2020. Accessed June 6, 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

W01 WATER QUALITY INDICATORS | P

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

Summary : This WELL feature requires the provision of water that meets thresholds for turbidity and coliforms for all water likely to come in contact with building occupants and verifies performance using 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.[1] 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,[1] along with posing an aesthetic concern. High turbidity water also can reduce the efficacy of water treatment technologies.[1]

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.[2]

PART 1 VERIFY WATER QUALITY INDICATORS

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 : Multifamily residential projects may achieve WELL Certification at the Bronze or Silver level without testing in dwelling units, but cannot achieve Gold or Platinum without testing in dwelling units. See Sampling Rates for Multifamily Residential in the WELL Performance Verification Guidebook for further details. Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

REFERENCES

1. World Health Organization. Guidelines for drinking-water quality. 4th ed. Geneva, Switzerland: WHO Press; 2017.
2. US Centers for Disease Control & Prevention. A Guide to Drinking Water Treatment Technologies for Household Use. Reference. Published 2014. Accessed Accessed December 10, 2019.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

W02 DRINKING WATER QUALITY | P

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

Summary : This WELL 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.[1] For example, natural deposits have caused arsenic to leach into some groundwaters to reach levels above drinking water health guidelines.[2] Water streams can also pick up contaminants from agricultural runoffs and direct industrial discharges,[3] 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.[1] 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.[4]

Solutions : Drinking water is treated and distributed to meet applicable legal requirements and regulations that may differ by country, [5] 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 inform of the potential for the uptake of corrosion byproducts and/or bacterial growth in drinking water.[1]

PART 1 MEET CHEMICAL THRESHOLDS

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

Note : Multifamily residential projects may achieve WELL Certification at the Bronze or Silver level without testing in dwelling units, but cannot achieve Gold or Platinum without testing in dwelling units. See Sampling Rates for Multifamily Residential in the WELL Performance Verification Guidebook for further details. Refer to the Performance Verification Guidebook for information on sensor/testing requirements, required testing duration and compliance calculations.

PART 2 MEET THRESHOLDS FOR ORGANICS AND PESTICIDES

For All Spaces:

Option 1: Drinking water quality report

The following requirements are met:

a. A municipal water quality report issued not more than one year before enrollment or the start of subscription reports on at least two of the pesticides below. All reported pesticides within the municipal water quality report comply with the following thresholds or are found to be compliant through Option 2, On-Site Testing:[1]
   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.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

7. Lindane: 0.002 mg/L or less.
8. Pentachlorophenol (PCP): 0.009 mg/L or less.

b. A municipal water quality report issued not more than one year before enrollment or the start of subscription reports on at least three of the organic contaminants below. All reported organic contaminants within the municipal water quality report comply with the following thresholds or are found compliant through Option 2, On-Site Testing:[1]

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: 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.

OR

Option 2: On-site testing

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:

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:

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.

REFERENCES

1. World Health Organization. Guidelines for drinking-water quality. 4th ed. Geneva, Switzerland: WHO Press; 2017.
2. World Health Organization. Arsenic. http://www.who.int/news-room/fact-sheets/detail/arsenic. Published 2018. Accessed 2020.
3. U.S. Environmental Protection Agency. National primary drinking water regulations. https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations. Published 2009. Accessed January 20, 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

4. World Health Organization. Trihalomethanes in Drinking-water. Geneva, Switzerland2005.
5. World Health Organization. Water Safety in Buildings. Geneva, 2011.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

W03 BASIC WATER MANAGEMENT | P

Intent : Implement protocols to reduce risk of water quality loss and *Legionella* colonization

Summary : This WELL feature requires projects to proactively test drinking water and to manage recirculating hot water systems against *Legionella* colonization.

Issue : All water systems require some degree of validation to ensure that the health targets are met under its operational conditions, for which sampling is an effective verification tool [1]. *Legionella* bacteria is naturally present in waters at low concentrations, but it may colonize recirculated water systems and can cause lung disease and even death if contaminated water aerosols are inhaled.[2] Legionnaire's disease affects especially the immunocompromised, smokers and those over age 50. [2] Assets commonly vulnerable to *Legionella* infestation include domestic potable and hot water systems, cooling towers, humidifiers, misters, decorative fountains, spas and hot tubs.[2]

Solutions : Basic management for water quality ensures that the water sourcing, treatment and delivery operates as designed. Turbidity, residual chlorine and pH monitoring help control basic chemical and microbiological water characteristics and, if trends are detected, may inform that actions may be needed to protect the quality of the water, such as changing a filter, check the building's pipes for leaks or inquire with the city for major works in the area. Management for minimizing *Legionella* requires a thorough and quantitative risk assessment of buildings' water assets, identifying locations where control is required, and a well-documented maintenance and operations program.[3] Implementing a proper *Legionella* management plan should reduce the risk of exposure to pathogenic bacteria.

PART 1 MONITOR CHEMICAL AND BIOLOGICAL WATER QUALITY

For All Spaces except Dwelling Units:

1: Drinking water quality report

The following requirements are met:

a. The following water parameters are sampled at drinking water dispensers in occupiable spaces at intervals of no less than once per year:
    1. Turbidity.
    2. pH.
    3. Residual (free) chlorine.
    4. Total coliforms, only if residual chlorine is below detection limits
b. Tests are required at 5% of drinking water dispensers, up to a maximum of four tests.
c. The water quality results are submitted annually through the WELL digital platform.

Note :

On-going testing does not need to be performed by a WELL Performance Testing Agent.

PART 2 IMPLEMENT LEGIONELLA MANAGEMENT PLAN

For All Spaces:

1: Legionella plan development

The project provides a Legionella management plan that meets the following requirements:

a. Addresses hot water systems, cooling towers, decorative fountains and any other devices or spaces under control of the project where water is recirculated and aerosolized.
b. Includes the items listed below:[3]
    1. Determination of roles for Legionella management in the building, distinguishing those under project control from those that may be the responsibility of building management or other parties.
    2. Water system inventory and process flow diagrams of systems within the project boundary.
    3. Hazard analysis of water assets within the project boundary. If the project does not operate the building hot water supply system (e.g., boilers, heaters, pumps or hot water risers), then an explanation of the building-wide Legionella management policies (if any) and how they influence risk is included.
    4. A list of monitoring actions for relevant variables (e.g., temperature or residual chlorine), performance limits associated with these variables, and corrective actions when variables exceed such limits.
    5. A list of critical control points (locations where actions to maintain relevant variables listed in (4) within performance limits are applied) within the project boundary.
    6. Verification and validation procedures for evaluating the suitability and proper implementation of the management plan. A Legionella sampling schedule is included if projects have operational control over cooling towers and spas.
    7. Protocols for documenting results of monitoring activities and corrective actions. If sampling for Legionella is planned, results are included.

2: Legionella plan implementation

The following requirement is met:

a. Project submits annually through the WELL digital platform documentation of monitoring results, corrective actions and *Legionella* sample results (if any) as stated in the Legionella management plan.

REFERENCES

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

1. World Health Organization. Guidelines for drinking-water quality. 4th ed. Geneva, Switzerland: WHO Press; 2017.
2. US Centers for Disease Control & Prevention. Legionella (Legionnaires' Disease and Pontiac Fever). https://www.cdc.gov/legionella/index.html. Published 2019. Updated April 30, 2018. Accessed December 20, 2019.
3. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 188-2018: Legionellosis: Risk Management for Building Water Systems. In.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

W04 ENHANCED WATER QUALITY | O (MAX : 1 PT)

Intent : Provide access to drinking water without unpleasant taste, odor and appearance.

Summary : This WELL 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.[1] Therefore, some regulatory bodies set non-enforceable limits based on human detectability and acceptability for these substances.[2,3]

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.

Impact : By managing nuisance chemicals, projects can provide more appealing and palatable drinking water.

PART 1 MEET THRESHOLDS FOR DRINKING WATER TASTE (MAX : 1 PT)

For All Spaces:

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

a. Aluminum ≤ 0.2 mg/L.[2]
b. Chloride ≤ 250 mg/L.[2]
c. Copper ≤ 1 mg/L.[2]
d. Manganese ≤ 0.05 mg/L.
e. Iron ≤ 0.3 mg/L.[2]
f. Silver≤ 0.1 mg/L.[2]
g. Sodium ≤ 270 mg/L.[3]
h. Sulfate ≤ 250 mg/L.[2]
i. Zinc ≤5 mg/L.[2]
j. Total Dissolved Solids (TDS) ≤ 500 mg/L.[2]
k. Free Chlorine ≤ 1.25 mg/L.[4]

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

REFERENCES

1. World Health Organization. Guidelines for drinking-water quality. 4th ed. Geneva, Switzerland: WHO Press; 2017.
2. U.S. Environmental Protection Agency. National Secondary Drinking Water Regulations. https://www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance-nuisance-chemicals. Published 2017. Accessed.
3. Health Canada. Guidelines for Canadian Drinking Water Quality—Summary Table. https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html. Published 2017. Accessed.
4. Crider Y, Sultana S, Unicomb L, Davis J, Luby SP, Pickering AJ. Can you taste it? Taste detection and acceptability thresholds for chlorine residual in drinking water in Dhaka, Bangladesh. Science of The Total Environment. 2018;613-614:840-846.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

W05 DRINKING WATER QUALITY MANAGEMENT | O (MAX : 3 PT)

Intent : Maintain and display consistent high quality of drinking water.

Summary : This WELL feature requires pre-testing of water quality parameters to determine treatment needs, monitoring at a more frequent interval and disclosure of water results.

Issue : Providing potable water to buildings is a multi-stage process that involves sourcing of the water, potabilization in treatment plants, distribution through 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,[1] unsupervised changes in municipal water supply and treatment[2] or weather-related events.

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.[3] Periodic water monitoring not only confirms the quality of the water, but also helps to determine the needs for maintenance in pipes, fixtures or treatment devices. Availability of water quality results and maintenance records to occupants may also increase drinking water consumption, furthering both cost-saving and sustainability efforts for the project, while also promoting occupant hydration.

PART 1 ASSESS AND MAINTAIN DRINKING WATER QUALITY (MAX : 2 PT)

For All Spaces:

1: Water quality pre-test

For first-time registered projects, the following requirements are met:

a. The project pre-tests water at least one month before Performance Verification for the parameters below:
    1. Turbidity.
    2. Coliforms.
    3. pH.
    4. Total Dissolved Solids (TDS).
    5. Total Chlorine.
    6. Residual (free) chlorine.
    7. Arsenic.
    8. Lead.
    9. Copper.
    10. Nitrate
    11. Benzene.
b. Sampling occurs at the following locations:
    1. The water dispenser that is closest to the pipe that delivers water into the project, before any point-of-entry water treatment system where possible.
    2. For projects with more than two floors or more than 10,000 sq. ft. in area, a second drinking water dispenser on the highest floor to which the project has access that is farthest from the location in requirement b(1).
    3. For projects of 12 or more floors, one additional drinking water dispenser for every 10 floors.
c. Samples must be taken with point-of-use filters or other water treatment devices bypassed or removed, if present.

Note : Projects pursuing re-certification do not need to achieve Option 1.

2: Water quality monitoring

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 exceeds these thresholds, remediation and re-testing occur within a month:
    1. Turbidity is 1.0 NTU, FTU or FNU or less.
    2. pH is between 6.5 and 9.0 (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 µg/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

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

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.

Note :

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

PART 2 PROMOTE DRINKING WATER TRANSPARENCY (MAX : 1 PT)

For All Spaces:

The following information is prominently displayed near sources of drinking water (or on a website available to occupants):

a. Water quality results from the most recent sampling, including date of testing and compliance with WELL thresholds.

b. If filters or other treatment units are in use, information about the treatment technologies and most recent date of device maintenance and/or filter cartridge replacement.

REFERENCES

1. World Health Organization. Water Safety in Buildings. Geneva, 2011.
2. Torrice M. How Lead Ended Up In Flint's Water. C&EN Global Enterprise. 2016;94(7):26-29.
3. World Health Organization. Guidelines for drinking-water quality. 4th ed. Geneva, Switzerland: WHO Press; 2017.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

W06 DRINKING WATER PROMOTION | O (MAX : 1 PT)

Intent : Promote proper hydration through the consumption of drinking water over less healthy alternatives by promoting access to drinking water of verified quality.

Summary : This WELL feature requires readily available and maintained dispensers for drinking water.

Issue : People in many parts of the world do not hydrate enough to meet health guidelines, even in places where drinking water is available at the tap such as the U.S., Europe and Australia.[1-3] Conversely, increased amounts of water consumption has been connected with better diet quality.[2,4] Although tap water is relatively inexpensive and can help reduce disparities in hydration,[5] public concerns about the quality of tap water has driven increased adoption of bottled water. While plastic bottled water allows for portable hydration, excess waste produced by the dumping and degradation of single-use bottles and the generation of microplastics is a serious environmental concern. Pollution produced by single use plastic products is a rising public health issue that requires a comprehensive toxicological assessment in order to understand its full impact.[6]

Solutions : The first step toward increasing consumption of good quality water is to make it readily available and address factors that limit access. When the addition of drinking fountains is combined with information sessions, consumption of plain water has been found to increase.[7] Finally, it is important to keep water dispensers in a state of good repair to encourage continued water consumption.[8] Using drinking water fixtures also allows fresh water to run through pipes, preventing losses in water quality.[9]

PART 1 ENSURE DRINKING WATER ACCESS (MAX : 1 PT)

For All Spaces except Dwelling Units:

1: Dispenser availability

The following requirements are met:

a. At least one drinking water dispenser on each floor that includes regularly occupied space is located within a 100 ft walk distance of all regularly occupied floor area and in all dining areas (except in areas where the presence of drinking water dispensers is forbidden by building codes or applicable regulations).

b. Water delivered by the dispensers is directly piped through the building's water supply or is stored in containers designed for refilling.

c. All newly installed drinking water fountains are designed for water bottle-refilling.

2: Dispenser maintenance

All drinking water dispensers meet the following requirement:

a. The mouthpieces/outlets, protective guards, aerators (if present), basins and touch points are cleaned on a daily basis.

REFERENCES

1. Malisova O, Athanasatou A, Pepa A, et al. Water Intake and Hydration Indices in Healthy European Adults: The European Hydration Research Study (EHRS). Nutrients. 2016;8(4).
2. Sui Z, Zheng M, Zhang M, Rangan A. Water and Beverage Consumption: Analysis of the Australian 2011-2012 National Nutrition and Physical Activity Survey. Nutrients. 2016;8(11).
3. Kenney EL, Long MW, Cradock AL, Gortmaker SL. Prevalence of Inadequate Hydration Among US Children and Disparities by Gender and Race/Ethnicity: National Health and Nutrition Examination Survey, 2009–2012. American Journal of Public Health. 2015;105(8):e113-e118.
4. Gazan R, Sondey J, Maillot M, Guelinckx I, Lluch A. Drinking Water Intake Is Associated with Higher Diet Quality among French Adults. Nutrients. 2016;8(11):689.
5. Brooks CJ, Gortmaker SL, Long MW, Cradock AL, Kenney EL. Racial/Ethnic and Socioeconomic Disparities in Hydration Status Among US Adults and the Role of Tap Water and Other Beverage Intake. American Journal of Public Health. 2017;107(9):1387-1394.
6. Picó Y, Barceló D. Analysis and Prevention of Microplastics Pollution in Water: Current Perspectives and Future Directions. ACS Omega. 2019;4(4):6709-6719.
7. Jasper C, Le T-T, Bartram J. Water and Sanitation in Schools: A Systematic Review of the Health and Educational Outcomes. International Journal of Environmental Research and Public Health. 2012;9(8):2772-2787.
8. Patel AI, Bogart LM, Uyeda KE, Rabin A, Schuster MA. Perceptions about availability and adequacy of drinking water in a large California school district. Prev Chronic Dis. 2010;7(2):A39-A39.
9. Ling F, Whitaker R, LeChevallier MW, Liu W-T. Drinking water microbiome assembly induced by water stagnation. The ISME Journal. 2018;12(6):1520-1531.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

W07 MOISTURE MANAGEMENT | O (MAX : 3 PT)

Intent : Limit the potential for bacteria and mold growth within buildings from water infiltration, condensation and internal leaks.

Summary : This WELL feature requires projects to develop strategies to minimize the presence of unintentional water and, when unavoidable, to manage it through material selection and inspections.

Issue : Excess moisture and dampness is a common problem in buildings, affecting about 20% of buildings in Europe, Canada and the U.S. [1] When improperly managed, moisture creates conditions conducive to the growth of mold and other biological pests, which can increase the risk of developing respiratory infections and asthma for those within the building.[1] It is estimated that one fifth of asthma cases in the U.S. are caused by excess moisture and dampness in buildings.[2] Furthermore, moisture can damage the building itself by creating an environment hospitable to insects and other destructive pests, corroding metal components and degrading wood and porous building materials.[3] These problems can arise when water unintentionally penetrates the building envelope or leaks from indoor uses of water, or when moisture-heavy air condenses on building materials.

Solutions : Through effective design of the building's curtain wall, water piping assemblies and ventilation systems, and by selecting appropriate materials where condensation may occur, projects can make conditions inhospitable to mold, microbes and pests, reducing the risk to respiratory health.[3,4] Inspections are needed to both verify that design and operations properly safeguards against mold growth, as well as inform the need for preventative maintenance.[4]

PART 1 DESIGN ENVELOPE FOR MOISTURE PROTECTION (MAX : 1 PT)

For All Spaces:

The building envelope aims to minimize moisture intrusion and accumulation through the following:[3]

a. For a project where construction occurs after enrollment or the start of subscription, verification of site drainage and storm water management during building construction phase.

b. Air tightness testing to assess water vapor transfer.

c. Adverse vapor pressure differentials that may cause condensation on interstitially hidden materials.

d. Entryway design that considers at least three strategies to minimize the ingress or permeation of water into the building.

e. Installation of a continuous drainage plane (e.g., a weather-resistant barrier integrated with flashing systems at penetrations), interior to the exterior cladding.

f. Minimization of capillary suction (wicking) in porous building materials through one of the below capillary break methods:

   1. Free-draining spaces (e.g., between exterior cladding, weather-resistant barriers in wall assemblies).
   2. Non-porous materials (e.g., closed-cell foams, waterproofing membranes, metal) between porous materials.

PART 2 DESIGN INTERIORS FOR MOISTURE MANAGEMENT (MAX : 1 PT)

For All Spaces:

1: Condensation and liquid water management

The project implements measures to manage moisture in interior spaces that address, at a minimum, the following:[3]

a. Protection of moisture-sensitive building materials and selection of moisture-resistant materials or finishes in surfaces likely to be exposed to liquid water (e.g., finished floors) or that may absorb moisture such as interior sheathing in basements, areas at or below grade, bathrooms, janitorial rooms or kitchens.

b. Condensation on cold surfaces such as basements, slab-on-grade floors, the inside of exterior walls and glazing.

2: Water leak control in fixtures

The following requirements are met:

a. All hard-piped fixtures, such as toilets, dishwashers, icemakers, water treatment devices and clothes washers, have a labeled, readily accessible single-throw manual shut-off or automatic shut-off at point-of-connection.

b. For water treatment devices that have a waste or drain line (e.g., reverse osmosis systems and water softeners), the drain or waste line is plumbed in-place and is equipped with a backflow prevention system such as an air gap or a backflow preventer valve.

PART 3 IMPLEMENT MOLD AND MOISTURE MANAGEMENT PLAN (MAX : 1 PT)

For All Spaces:

1: Operational moisture management

The project implements a moisture management plan for building operations that contains the following:

a. A schedule of periodic inspections for signs and potential sources of water damage or pooling, discoloration and mold on ceilings, walls, floors and HVAC equipment.[3]

b. A system or inspection protocol to periodically assess water pipe leaks.

c. A system for occupants and tenants to notify building management about mold or water damage.

2: Leaks and mold inspections

The following requirement is met:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

a. Results of inspections for mold and leaks (including any mold test results) are submitted annually through the WELL digital platform.

REFERENCES

1. Institute of Medicine. Damp Indoor Spaces and Health. Washington, D.C.: National Academies Press; 2004.
2. Mudarri D, Fisk WJ. Public health and economic impact of dampness and mold. Indoor Air. 2007;17(3).
3. U. S. Environmental Protection Agency. Moisture Control Guidance for Building Design, Construction and Maintenance. Washington, DC2013.
4. World Health Organization. WHO guidelines for indoor air quality: dampness and mould. 2009.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

W08 HYGIENE SUPPORT | O (MAX : 4 PT)

Intent : Ensure availability of bathrooms and support hygienic hand washing and toilet use practices for all individuals.

Summary : This WELL feature requires projects to provide bathroom furnishings that accommodate a variety of needs and enhance hygiene by including large sinks, soap containers, hand drying support and reduced touch fixtures.

Issue : All humans share the critical need to access bathrooms. Proper hand hygiene is key to reducing the incidence of gastrointestinal and respiratory diseases after bathroom use. [1] Something as seemingly simple as using the bathroom can be challenging for some.[2–4] For example, women often lack necessary bathroom accommodations due to a lack of sufficient sanitary materials.[2,4] Caregivers, small children, older adults or other individuals who require assistance frequently lack access to spaces that support their needs. [2] Despite hand washing, hands can only become as clean as the surrounding environment. Sinks may harbor pathogenic bacteria that can migrate onto hands during washing.[5] Water splashing from the drain may spread bacteria to surrounding areas.[6-9] Additionally, soap and the inside of liquid soap containers often remain contaminated after use; thus, best practice and research recommends that soap dispensers not be topped off.[7,8] Lastly, once an individual's hands are cleaned, they can more easily become re-infected when wet compared to when dry. [5,10]

Solutions : Bathrooms can be designed and furnished to ease hygiene, particularly for menstruating women (e.g., by supplying female hygiene products) [2,4] and for supporting caregivers of children[11] and individuals with physical and mental disabilities.[2] Trash receptacles, baby changing stations, large sinks, fragrance-free soap, hand dryers and fixtures that minimize unnecessary contact with the hands can be provided. Single-user facilities with gender neutral signage make bathrooms available for all individuals.[12] Visual cues that promote hand hygiene may improve compliance with established guidelines in certain segments of the population.[13-15]

PART 1 PROVIDE EQUIPPED BATHROOMS (MAX : 1 PT)

For All Spaces except Dwelling Units & Guest Rooms:

1: Furnishings for all bathrooms

The project meets the following requirements:

a. All bathrooms include:
    1. Trash receptacles in stalls (in women's and single-user bathrooms). If toilet paper cannot be flushed down toilets, trash receptacles must be placed in all bathroom stalls such that they do not impede wheelchair/mobility aid access.
    2. Sanitary pads, tampons and/or other menstrual products at no cost or subsidized by at least 50% (in women's and single-user bathrooms).
    3. A hook, shelf or equivalent storage support in each toilet stall. For wheelchair accessible stalls, storage support items are placed no higher than 122 cm.
b. All occupants have access to at least one bathroom per occupiable floor that provides a stall that can accommodate a wheelchair user and care attendant.
c. All occupants have access to at least one bathroom that provides an infant changing table.
d. All regular occupants may confidentially request a syringe drop box, which is made available at no cost in one or more bathrooms.[16]
e. All single-user bathrooms (if present) are open to all individuals with accompanying signage.
f. If present, floor drains are equipped with a self-primed liquid-seal trap or a waterless trap seal.[17]

2: Furnishings for family bathrooms

For projects where the majority of occupants are visitors (e.g., shopping malls, airports, museums), family bathrooms are provided to meet expected demand by individuals in need of accompaniment or assistance in the bathroom (e.g., children, individuals with mental or physical disabilities) and contain the following amenities:[18]

a. Changing table for infants.
b. Children's toilet facilities or accommodations for child use of adult-size toilet.
c. Children's sinks or accommodations for child use of adult-size sink (e.g., availability of stepstool).
d. Motion sensor lights.
e. Slip-resistant floors.
f. Grab bars.
g. At least one designated location for bags in each stall (e.g., hook, shelf separate from changing table and sink).
h. Meets the room and stall dimensions required by local code for wheelchair accessibility.

PART 2 PROVIDE HANDS-FREE FIXTURES IN BATHROOMS (MAX : 1 PT)

For All Spaces except Dwelling Units & Guest Rooms:

All bathrooms meet the following requirements:

a. Toilets are equipped with hands-free flushing.
b. Contactless soap dispensers and hand-drying accommodations are provided.
c. Users can exit the bathroom hands-free.
d. Faucets meet the following:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

1. Sensor-activated.
2. Equipped with a programmable line-purge system.
3. If mixing is used, hot- and cold-water lines are mixed at the point of use.

PART 3 SUPPORT EFFECTIVE HANDWASHING (MAX : 1 PT)

For All Spaces:

All sinks where handwashing is expected (e.g., kitchens, bathrooms, break rooms and wellness rooms), meet the following requirements:

a. The faucet design prevents the water column from flowing directly into the drain or a sink drain stopper is installed.[6,19]

b. Water does not splash outside the sink when the faucet is fully open.

c. Newly installed sinks meet the following design parameters:

1. The sink basin is at least 9 inches across in the smallest dimension, measured at the point where the user is expected to place hands during hand washing.
2. The water column from the faucet spout to the basin is at least 8 inches in length (measured along flow of water, even if at an angle).
3. The water column is at least 3 inches away from any edge of the sink.

PART 4 PROVIDE HANDWASHING SUPPLIES AND SIGNAGE (MAX : 1 PT)

Note : Projects may only achieve this part if Part 1, Part 2 or Part 3 is also achieved.

For All Spaces except Dwelling Units & Guest Rooms:

1: Handwashing support

For all sinks where handwashing is expected (e.g., bathrooms, break rooms, food prep and wellness rooms), the following are present within the room:

a. Fragrance-free liquid hand soap dispensed through one of the following:

1. Sealed dispensers equipped with disposable soap cartridges.
2. Dispensers with detachable and closed containers for soap refill. Soap containers must be washed and disinfected when emptied, before refilling.

b. One of the following methods for hand drying:

1. Paper towels.
2. Hand dryers equipped with a HEPA filter. Filter replacement and equipment maintenance are carried out per manufacturer's instructions. This method is not available for healthcare projects.
3. Fabric hand towel rolls with dispensers, with rolls replaced before reaching their end of service.
4. Washable fabric hand towels accompanied by a used towel container placed nearby. Towels are washed before reuse.

c. Signage displaying steps for proper hand washing.

For Commercial Kitchen Spaces & Commercial Dining Spaces:

1: Provide Handwashing Signage in Commercial Kitchens

The following requirement is met:

a. Clear signage directing toward the nearest handwashing location is present at the entrance to all areas intended for food preparation and consumption.

For Guest Rooms:

The following are provided in each bathroom:

a. Fragrance-free hand soap via one of the following:

1. Individually wrapped bar soap, replaced during room turnover, and drainable soap bar racks.
2. Sealed dispensers of liquid soap equipped with disposable soap cartridges.
3. Liquid soap dispensers with detachable and closed containers for soap refill. Soap containers must be washed and disinfected when emptied, before refilling.

b. One of the following methods for hand drying:

1. Reusable cloth towels, replaced and washed at least during room changeover.
2. Paper towels.
3. Hand dryers equipped with a HEPA filter. Filter replacement and equipment maintenance are carried out per

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

manufacturer's instructions.

4. Fabric hand towel rolls with dispensers, with rolls replaced before reaching their end of service.

REFERENCES

1. Aiello AE, Coulborn RM, Perez V, Larson EL. Effect of hand hygiene on infectious disease risk in the community setting: A meta-analysis. American Journal of Public Health. 2008;98(8):1372-1381.
2. Anthony KH, Dufresne M. Potty Parity in Perspective: Gender and Family Issues in Planning and Designing Public Restrooms. Journal of Planning Literature. 2007;21(3):267-294.
3. Margolin S, Poggiali J. "Where Are the Bathrooms?": Academic Library Restrooms and Student Needs. Journal of Library Administration. 2017;57(5):481-499.
4. Schmitt ML, Clatworthy D, Ogello T, Sommer M. Making the Case for a Female-Friendly Toilet. Water. 2018;10(9):1193.
5. Jumaa PA. Hand hygiene: simple and complex. International Journal of Infectious Diseases. 2005;9(1):3-14.
6. Parkes LO, Hota SS. Sink-Related Outbreaks and Mitigation Strategies in Healthcare Facilities. Current Infectious Disease Reports. 2018;20(10):42.
7. Chattman M, Maxwell SL, Gerba CP. Occurrence of Heterotrophic and Coliform Bacteria in Liquid Hand Soaps From Bulk Refillable Dispensers in Public Facilities. Journal of Environmental Health. 2011;73(7):26-30.
8. Schaffner DW, Jensen D, Gerba CP, Shumaker D, Arbogast JW. Influence of Soap Characteristics and Food Service Facility Type on the Degree of Bacterial Contamination of Open, Refillable Bulk Soaps. Journal of Food Protection. 2018;81(2):218-225.
9. Kotay SM, Donlan RM, Ganim C, Barry K, Christensen BE, Mathers AJ. Droplet- Rather than Aerosol-Mediated Dispersion Is the Primary Mechanism of Bacterial Transmission from Contaminated Hand-Washing Sink Traps. Applied and Environmental Microbiology. 2019;85(2):e01997-01918.
10. Huang C, Ma W, Stack S. The Hygienic Efficacy of Different Hand-Drying Methods: A Review of the Evidence. Mayo Clinic Proceedings. 2012;87(8):791-798.
11. U.S. House of Representatives. Bathrooms Accessible in Every Situation or BABIES Act. In: 114th Congress, ed. HR 347. Vol 114-2352016.
12. Clark CR. Rethinking Gendered Spaces: Bathrooms and Safe Access for Trans People [Master's Thesis]. Sacramento: Division of Social Work, California State University, Sacramento; 2011.
13. Lawson A, Vaganay-Miller M. The Effectiveness of a Poster Intervention on Hand Hygiene Practice and Compliance When Using Public Restrooms in a University Setting. International Journal of Environmental Research and Public Health. 2019;16(24).
14. Ford EW, Boyer BT, Menachemi N, Huerta TR. Increasing Hand Washing Compliance With a Simple Visual Cue. American Journal of Public Health. 2013;104(10):1851-1856.
15. Pellegrino R, Crandall PG, O'Bryan CA, Seo H-S. A review of motivational models for improving hand hygiene among an increasingly diverse food service workforce. Food Control. 2015;50:446-456.
16. Dimmick BL, Douglas D. Reasonable Accommodations for Diabetes Management in the Workplace. In: American Diabetes Association; 2014:1-26.
17. International Code Council. 2018 International Plumbing Code. In. 1002.4 Trap Seals. Washington, DC 2019.
18. Anthony HK, Dufresne M. Potty parity in perspective: Gender and family issues in planning and designing public restrooms. Journal of Planning Literature. 2007;21(3):267-294.
19. Kotsanas D, Wijesooriya WRPLI, Korman TM, et al. "Down the drain": carbapenem-resistant bacteria in intensive care unit patients and handwashing sinks. Medical Journal of Australia. 2013;198(5):267-269.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

W09 B ONSITE NON-POTABLE WATER REUSE | O (MAX : 2 PT)

Intent : Conserve water through non-potable water systems without compromising the health of the building occupants.

Summary : This WELL feature requires projects to implement a safety plan when capturing and using non-potable water within the project boundary.

Issue : Efficient water management is an ever-growing need for supporting and sustaining human existence.[1] The rise of extreme droughts and subsequent long-term water scarcity are requiring changes in how humans think about and use water.[1] Conversely, severe rain events can overload wastewater treatment plants with storm- and rainwater, potentially resulting in combined sewer overflows (CSOs), in which untreated water is released to natural bodies of water and beaches downstream.[2] Buildings can reduce the pressure on city-wide water infrastructure by supporting efficient allocation of resources, such as minimizing the use of municipally sourced water for applications that do not require potability (e.g., irrigation, flushing toilets).[2] However, without proper design and operations management, there is a risk of contamination of potable water lines or oral or respiratory exposure to non-potable water.[2-6]

Solutions : The design and operations of a healthy, non-potable water system must address the water sources and uses. For instance, water coming from clothes washers and showers, as well as stormwater collected at the street level, requires treatment and water quality monitoring before reuse. The system should be designed so that water capture and reuse does not create niches of water stagnation, and storage tanks for non-potable water need periodic checks and safeguards against overflows.[5] Additionally, pipes destined to distribute non-potable water must not be commingled with those for drinking water, and proper control measures must be in place if potable water supplements non-potable water applications (e.g., toilet flushing).[2] Finally, smells and odors need to be managed to avoid the perception of a health threat, as this may hinder efforts to improve water management and conservation in a building.[7, 8] While there are many factors to consider, these challenges can be managed through a properly implemented safety plan that addresses health endpoints in the collection, treatment and distribution of non-potable water within the building.[9] The success in the implementation of this plan also depends on third party verification, in which the plan is evaluated with respect to the achievement of its health endpoints.[10] Additionally, education and signage are essential in supporting occupants' understanding of the positive impact of sensible water utilization within buildings and of the measures taken to protect human health.[11] By properly managing and controlling non-potable water reuse and capture systems, projects can help maintain occupant health and safety, while contributing to decreased water use by up to 75% in new buildings.[12]

PART 1 IMPLEMENT SAFETY PLAN FOR NON-POTABLE WATER CAPTURE AND REUSE (MAX : 2 PT)

For All Spaces:

1: Safety plan description

The project or organization implements a safety plan that contains the following:[5-9]

a. A list of key roles for design, operations, maintenance and third-party inspection of the non-potable water system capture, treatment and use.

b. A list of all applicable codes and regulations in the jurisdiction where the non-potable water reuse system is being installed and that govern the design, commissioning, and approval of operation of the system.

c. A process flow diagram that displays the non-potable water sources, conveyances, storage units, treatment devices and points of use, emphasizing the points where makeup potable water (i.e., water needed to supplement non-potable needs) may be added.

d. A description of the system that includes the sources and estimated contaminant loads of the non-potable water, the intended uses for the non-potable water, the water treatment devices (if any) and their certifications, and the water quality parameters expected at the points of use.

e. An analysis of how human exposure to pathogens through ingestion and inhalation of non-potable water is minimized, including (if applicable) a description of how the potable water network is protected from the introduction of non-potable water, emphasizing strategies that address cross-connection control and backflow prevention.

f. A description of the signage and identifiable pipe color-coding to distinguish the non-potable water network.

g. A list of strategies for the control of odors, nuisances and vectors due to stagnation of non-potable water.

h. The provisions for emergency operations caused by overflow of storage tanks, leaks and outages.

i. A list of operational parameters (such as flow, turbidity, coliforms or other treatment-dependent indicators) to monitor the intended functioning of the water system, their monitoring frequency and control actions if such parameters are beyond target ranges.

j. A list of control points where the operational parameters are being measured.

k. A list of routine maintenance protocols and schedules.

l. A description of the procedures for system startup, determination of protocols for verification of the safety plan, including Legionella testing if a risk of inhalation exists, and schedule for third-party inspections.

2: Safety plan implementation

Documentation of the following are submitted annually through the WELL digital platform:

a. Startup procedure.

b. Maintenance logs.

c. Results from verification tests (when applicable).

d. Third-party inspections.

3: Safety plan communications

Conspicuous signage is present to communicate the following:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

a. To distinguish potable from non-potable water (where applicable).

b. To highlight the safety features and conservation goals of the non-potable water system.

Note :

Projects are not required to provide information on the individuals assigned to perform the key roles determined in the safety plan.

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. City of Cape Town, Cape Town Water Strategy - our shared water future.
2. Sharvelle, S. A., N.; Clerico, E.; Hultquist, R.; Leverenz, H.; and A. Olivieri. Risk-Based Framework for the Development of Public Health Guidance for Decentralized Non-Potable Water Systems; Prepared by the National Water Research Institute for the Water Environment & Reuse Foundation.: Alexandria, VA, 2017.
3. BIO by Deloitte Optimising water reuse in the EU – Final report prepared for the European Commission (DG ENV), Part I. In collaboration with ICF and Cranfield University.; 2015.
4. Hernández, F.; Urkiaga, A.; De las Fuentes, L.; Bis, B.; Chiru, E.; Balazs, B.; Wintgens, T., Feasibility studies for water reuse projects: an economical approach. Desalination 2006, 187, (1), 253-261.
5. San Francisco Department of Public Health, Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems. In Health, S. F. D. o. P., Ed. San Francisco, CA, 2017.
6. Hamilton, K. A.; Hamilton, M. T.; Johnson, W.; Jjemba, P.; Bukhari, Z.; LeChevallier, M.; Haas, C. N., Health risks from exposure to Legionella in reclaimed water aerosols: Toilet flushing, spray irrigation, and cooling towers. Water Research 2018, 134, 261-279.
7. BIO Intelligence Service Water Performance of Buildings, Final Report prepared for European Commission, DG Environment; 2012.
8. Oesterholt, F.; Martijnse, G.; Medema, G.; van der Kooij, D., Health risk assessment of non-potable domestic water supplies in the Netherlands. Journal of Water Supply: Research and Technology-Aqua 2007, 56, (3), 171-179.
9. Goodwin, D.; Raffin, M.; Jeffrey, P.; Smith, H. M., Applying the water safety plan to water reuse: towards a conceptual risk management framework. Environmental Science: Water Research & Technology 2015, 1, (5), 709-722.
10. Natural Resource Management Ministerial Council; Environment Protection and Heritage Council; Australian Health Ministers' Conference, National Guidelines for Water Recycling: Managing Health and Environmental Risks. In Canberra, Australia, 2006.
11. Frijns, J.; Smith, M. H.; Brouwer, S.; Garnett, K.; Elelman, R.; Jeffrey, P., How Governance Regimes Shape the Implementation of Water Reuse Schemes. Water 2016, 8, (12).
12. City and County of San Francisco. On-site Non-potable Water Use: Guide for the collection, treatment, and reuse of alternate water supplies in San Francisco. Reference

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

NOURISHMENT

The WELL Nourishment concept requires the availability of fruits and vegetables and nutritional transparency. It encourages the creation of food environments, where the healthiest choice is the easiest choice.

Healthy diets have the potential to nurture human health and prevent several diet-related diseases, including cardiovascular disease, high blood pressure and diabetes. However, poor nutrition remains a top contributor to the global burden of disease, accounting for more than one in every five deaths globally.[1] In fact, unhealthy diets pose a greater risk to morbidity and mortality than drug, alcohol and tobacco use combined.[1] The global population is currently facing a double burden of disease, in which much of the population is malnourished and suffering from micronutrient deficiencies, as well as an increasing prevalence of overweight, obesity and non-communicable diseases. Diets around the world are generally low in fruits, vegetables, whole grains, nuts and seeds,[2] and are characterized by increasing intakes of highly processed foods, including refined sugars and refined oils, as well as the growing consumption of meat.[3] Fortunately, individual dietary choices have the potential to shift global dietary patterns toward healthier diets, providing major health benefits and preventing diet-related diseases.

Diets inextricably link human health and environmental health and sustainability. The current global transition towards unhealthy and unsustainably produced food is threatening global food systems as food production remains one the largest contributors to global environmental change.[4] In 2019, the EAT-Lancet Commission developed, for the first time, global scientific targets for a healthy reference diet based on the best available evidence for healthy diets and sustainable food production.[5] This healthy reference diet can be adapted to all food cultures and is characterized by a variety of vegetables, fruits, whole grains, legumes, nuts and seeds, and small amounts of animal source foods, highly processed foods, refined grains and added sugars.[5] Given the strong connection between food production and food availability and consumption, global achievement of healthy diets from sustainable food systems requires a global food transformation.[5]

Our dietary patterns are influenced by a complex mixture of personal, cultural and environmental factors, including the buildings and communities where we spend the majority of our time and consume the majority of our meals. The way our food environments are designed and operated, as well as the availability and access to foods and beverages in these environments, has the potential to support healthy diets and improve human health with the health of the planet in mind. In fact, research shows that individual change is more likely to occur when environmental conditions and influences are aligned to support individual behaviors.[6,7] Therefore, improving diet quality and eating behaviors requires a holistic approach, which includes both supportive policies and environmental change.[8,9]

The WELL Nourishment concept supports healthy and sustainable eating patterns by increasing access to fruits and vegetables, limiting the availability of highly processed foods and designing environments that nudge individuals toward healthier choices.

Note : Read more about the evidence behind the WELL Nourishment Concept. Note: Material from the research digests is not covered on the WELL AP exam.

REFERENCES

1. Afshin A, Sur PJ, Fay KA, et al. Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet. 2019;393(10184):1958-1972. doi:10.1016/S0140-6736(19)30041-8
2. Gakidou E, Afshin A, Abajobir AA, et al. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016. Lancet. 2017;390(10100):1345-1422. doi:10.1016/S0140-6736(17)32366-8
3. Popkin BM, Adair LS, Ng SW. Global nutrition transition and the pandemic of obesity in developing countries. Nutr Rev. 2012;70(1):3-21. doi:10.1111/j.1753-4887.2011.00456.x
4. Tilman D, Clark M. Global diets link environmental sustainability and human health. Nature. 2014;515(7528):518-522. doi:10.1038/nature13959
5. Willett W, Rockström J, Loken B, et al. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. Lancet. 2019;393(10170):447-492. doi:10.1016/S0140-6736(18)31788-4
6. Story M, Kaphingst KM, Robinson-O'Brien R, Glanz K. Creating Healthy Food and Eating Environments: Policy and Environmental Approaches. Annu Rev Public Health. 2008;29(1):253-272.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

doi:10.1146/annurev.publhealth.29.020907.090926

7. Schwartz MB, Just DR, Chriqui JF, Ammerman AS. Appetite self-regulation: Environmental and policy influences on eating behaviors. Obesity. 2017;25:S26-S38. doi:10.1002/oby.21770
8. Niebylski ML, Lu T, Campbell NRC, et al. Healthy food procurement policies and their impact. Int J Environ Res Public Health. 2014;11(3):2608-2627. doi:10.3390/ijerph110302608
9. Gorton D, Carter J, Cvjetan B, Mhurchu CN. Healthier vending machines in workplaces: Both possible and effective. N Z Med J. 2010;123(1311):43-52.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N01 FRUITS AND VEGETABLES | P

Intent : Promote the consumption of fruits and vegetables by increasing the availability and accessibility of fruits and vegetables.

Summary : This WELL feature requires the provision and promotion of fruits and vegetables, if food is sold or provided on a daily basis.

Issue : Fruits and vegetables are a key component of a healthy dietary pattern for the prevention of chronic disease.[1] However, most individuals around the world do not meet the daily recommended five servings (400 g).[1] Insufficient fruit and vegetable intake is attributed to 5.2 million deaths worldwide in 2013, as well as 14% of gastrointestinal cancer deaths, 11% of ischemic heart disease deaths and 9% of stroke deaths globally.[2] Greater consumption of fruits and vegetables is associated with a reduced risk of cardiovascular disease, obesity, type 2 diabetes, stroke and certain types of cancers, as well as improved weight management.[1,3–5] Eating a variety of fruits and vegetables also helps to ensure adequate nutrient, micronutrient and dietary fiber intake.[6]

Solutions : Increasing the availability and access of fruits and vegetables can support fruit and vegetable consumption. Increased availability of fresh fruit at worksites has been shown to improve fruit and vegetable consumption at work and at home, indicating that individuals take these healthier habits home.[7] Strategies to increase fruit and vegetable consumption include behavioral interventions, such as increased availability and visibility of fruits and vegetables, pricing incentives to lower the cost of fruits and vegetables and promotion and support of community gardens and urban agriculture initiatives.[8]

PART 1 PROVIDE FRUITS AND VEGETABLES

For All Spaces except Commercial Dining Spaces:

Option 1: Food offerings

Each food outlet meets one of the following requirements:

a. The selection includes at least two different individually selectable fruit offerings (containing no added sugar) and at least two different individually selectable non-fried vegetable offerings.[9]

b. At least 50% of available food options are individually selectable fruit offerings (containing no added sugar) and/or individually selectable non-fried vegetable offerings.

OR

Option 2: No food offerings

The following requirement is met:

a. There are no foods sold or provided on a daily basis by (or under contract with) the project owner.

For Commercial Dining Spaces:

One of the following requirements is met:

a. The selection includes at least four different individually selectable fruit offerings (containing no added sugar) and at least four different individually selectable non-fried vegetable offerings.[10]

b. At least 50% of available food options are individually selectable fruit offerings (containing no added sugar) and/or individually selectable non-fried vegetable offerings.

PART 2 PROMOTE FRUIT AND VEGETABLE VISIBILITY

For All Spaces:

Option 1: Food offerings

Fruit and vegetable offerings sold or provided on a daily basis by (or under contract with) the project owner meet the following requirements:

a.

Fruit and vegetable offerings that are self-serve meet at least one of the following:

i. Are located at eye-level or just below eye-level.[9,11,12]

ii. Are displayed on a countertop, table or other visible surface.[13]

iii. Are located at point-of-sale or point-of-purchase.[9,11,12]

iv. Are located at the end of aisles.[9,11,12]

v. Are located at the beginning of food service lines.[9,11,12]

vi. Are visible from the food outlet entrance.[14]

b.

If food is prepared on-site and presented on menus (including digital menus and menu boards), fruit and vegetable offerings meet at least three of the following:

i. Are included as default options throughout the menu.[11]

ii. Are listed using appealing descriptions.[15,16]

iii. Are visually highlighted through icons, different colors or bolding.[17]

iv. Are listed first in each menu section.[17]

v. Are listed in prominent areas of the menu (e.g., the top, bottom, corners).[17]

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

OR

Option 2: No food offerings

The following requirement is met:

a. There are no foods sold or provided on a daily basis by (or under contract with) the project owner.

REFERENCES

1. World Health Organization. Diet, nutrition and the prevention of chronic diseases-Report of the joint WHO/FAO expert consultation. 2003. http://www.who.int/dietphysicalactivity/publications/trs916/intro/en/.
2. World Health Organization. The World Health Report: Reducing Risks, Promoting Healthy Life. 2002. http://epsl.asu.edu/ceru/Documents/whr_overview_eng.pdf.
3. Lock K, Pomerleau J, Causer L, Altmann DR, McKee M. The global burden of disease attributable to low consumption of fruit and vegetables: implications for the global strategy on diet. Bull World Heal Organ. 2005;83(2):100-108. doi:/S0042-96862005000200010
4. World Cancer Reserach Fund, American Institute for Cancer Research. Food, Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective. 2007. http://www.aicr.org/assets/docs/pdf/reports/Second_Expert_Report.pdf.
5. Hartley L, Igbinedion E, Holmes J, et al. Increased consumption of fruit and vegetables for the primary prevention of cardiovascular diseases. Cochrane Database Syst Rev. 2013;2013(6). doi:10.1002/14651858.CD009874.pub2
6. U.S. Department of Health and Human Services, U.S. Department of Agriculture. Dietary Guidelines for Americans, 2015-2020. 2015. https://health.gov/dietaryguidelines/2015/resources/2015-2020_Dietary_Guidelines.pdf.
7. Backman D, Gonzaga G, Sugerman S, Francis D, Cook S. Effect of Fresh Fruit Availability at Worksites on the Fruit and Vegetable Consumption of Low-Wage Employees. J Nutr Educ Behav. 2011;43(4):S113-S121. doi:10.1016/j.jneb.2011.04.003
8. Centers for Disease Control and Prevention. The CDC Guide to Strategies to Increase the Consumption of Fruits and Vegetables. 2011. https://www.cdc.gov/obesity/downloads/strategies-fruits-and-vegetables.pdf.
9. American Heart Association, American Stroke Association. American Heart Association Healthy Workplace Food & Beverage Toolkit. 2015. https://www.heart.org/idc/groups/heart-public/@wcm/@fc/documents/downloadable/ucm_465693.pdf.
10. New York State Department of Health. Food Standards: Cafeterias/Cafes. 2012. https://www.health.ny.gov/diseases/cardiovascular/heart_disease/toolkits/docs/cafeterias_cafes_implementation_g
11. Centers for Disease Control and Prevention. Smart Food Choices: How to Implement Food Service Guidelines in Public Facilities, 2014. 2014. https://www.scha.org/files/documents/smart_food_choices.pdf.
12. Food Service Guidelines Federal Working Group. Food Service Guidelines for Federal Facilities. 2017. Reference.
13. Cadario R, Chandon P. Which Healthy Eating Nudges Work Best? A Meta-Analysis of Field Experiments. Marketing Science Published online in Articles in Advance. 2019:1-22. doi:10.1287/mksc.2018.1128
14. Caspi CE, Lenk K, Pelletier JE, et al. Association between store food environment and customer purchases in small grocery stores, gas-marts, pharmacies and dollar stores. Int J Behav Nutr Phys Act. 2017;14(1):76. doi:10.1186/s12966-017-0531-x
15. Turnwald BP, Boles DZ, Crum AJ. Association between indulgent descriptions and vegetable consumption: Twisted carrots and dynamite beets. JAMA Intern Med. 2017;177(8):1216-1218. doi:10.1001/jamainternmed.2017.1637
16. Wansink B. How Descriptive Menu Labels Influence Attitudes and Repatronage. Adv Consum Res. 2000;29:1-5.
17. Wansink B, Love K. Slim by design: Menu strategies for promoting high-margin, healthy foods. Int J Hosp Manag. 2014;42:137-143. doi:10.1016/j.ijhm.2014.06.006

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N02 NUTRITIONAL TRANSPARENCY | P

Intent : Help individuals make informed food choices through nutritional labeling and allergy information.

Summary : This WELL feature requires the provision of detailed nutritional information, calorie labeling for standard menu items and sugar content labeling for all foods and beverages sold or provided on a daily basis.

Issue : Nutrition information panels and nutrition fact labels are often found on packaged foods and beverages. These provide consumers with useful nutrient, ingredient and food allergen information that can be used to guide food choices and daily intake. However, the same level of nutritional transparency does not exist for foods and beverages in restaurants, vending machines and a variety of food retail establishments. Nutritional transparency is especially important for the millions of individuals with food allergies and food intolerances, who must navigate many issues when dining away from home. Moreover, evidence suggests that health warnings can help increase health knowledge and the purchase and consumption of certain products.[1]

Solutions : Although evidence is inconsistent as to whether calorie labeling reduces calories purchased or calories consumed, the increased transparency has led to the introduction of lower-calorie items in restaurants and other food establishments.[2–4] Research also suggests that calorie labeling and similar health labeling interventions may serve as important sources of nutritional information for consumers, resulting in healthier food choices and increased calorie information awareness.[5–7] Since there is no cure for food allergies, avoidance of food allergens is a recommended strategy for preventing serious allergic reactions, such as anaphylaxis. Food service professionals play a critical role in helping consumers navigate food choices and making all spaces safer for individuals with food allergies and intolerances. Food allergy training helps ensure that all food service staff are properly trained to address potential food allergens and intolerances.

PART 1 PROVIDE NUTRITIONAL INFORMATION

For All Spaces:

Option 1: Food offerings

For packaged foods and beverages (including items in vending machines) and self-serve bulk foods, sold or provided on a daily basis by (or under contract with) the project owner, the following nutrition information is clearly displayed at point-of-decision on packaging or adjacent signage:

a. Total calories per serving or package.

b. Macronutrient content (total protein, total fat and total carbohydrate) in weight and/or as a percent of the estimated daily requirements (daily values) per serving or package.

c. Total sugar content per serving or package.

OR

Option 2: No packaged food offerings

The following requirement is met:

a. There are no packaged foods and beverages sold or provided on a daily basis by (or under contract with) the project owner.

For Commercial Dining Spaces:

For standard menu items sold or provided by (or under contract with) the project owner, the following requirements are met:

a. The number of calories contained in each standard menu item, as usually prepared and offered for sale, is clearly displayed at the point-of-decision.

b. The macronutrient content (total protein, total fat and total carbohydrate) and total sugar content of each standard menu item is available upon request.

PART 2 ADDRESS FOOD ALLERGENS

For Commercial Kitchen Spaces:

Food is prepared on-site by (or under contract with) the project owner on a daily basis and the following requirements are met:

a. All food service staff (including managers, servers and kitchen staff) are offered annual food allergy training that covers, at a minimum, the following topics:[8]

   1. Overview of food allergies.
   2. Anaphylaxis response protocols.
   3. Emergency response protocols.
   4. Communications protocols.
   5. Reducing risk for cross-contact.
   6. Use of recipes and ingredient disclosure.
   7. Knowledge test.

b. At least one food service staff member who has completed the food allergy training within 12 months is present to handle questions and special requests from individuals about food allergens during hours of operation.

For Commercial Dining Spaces:

Food is prepared on-site by (or under contract with) the project owner on a daily basis and the following requirement

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

is met: a. Point-of-decision signage is present to encourage individuals to report their food allergies to food service staff.

PART 3 LABEL SUGAR CONTENT

For Commercial Dining Spaces:

Option 1: No high sugar foods

For standard menu items sold or provided by (or under contract with) the project owner, the following requirement is met:

a. Standard menu items do not contain more than 25 g of sugar per serving.

OR

Option 2: Label high sugar foods

For standard menu items sold or provided by (or under contract with) the project owner, one of the following requirements is met:

a. The total sugar content for each standard menu item, as usually prepared and offered for sale, is clearly displayed at the point-of-decision (in addition to calories as required in Part 1 of this feature).

b. Standard menu items containing more than 25 g of sugar per serving are identified by an icon at the point-of-decision, along with an explanation of the icon and the health risks of high sugar intake.

REFERENCES

1. Hammond D. Health warning messages on tobacco products: a review. doi:10.1136/tc.2010.037630
2. Vadiveloo MK, Dixon LB, Elbel B. Consumer purchasing patterns in response to calorie labeling legislation in New York City. Int J Behav Nutr Phys Act. 2011;8(1):51. doi:10.1186/1479-5868-8-51
3. Pulos E, Leng K. Evaluation of a voluntary menu-labeling program in full-service restaurants. Am J Public Health. 2010;100(6):1035-1039. doi:10.2105/AJPH.2009.174839
4. Bleich SN, Economos CD, Spiker ML, et al. A Systematic Review of Calorie Labeling and Modified Calorie Labeling Interventions: Impact on Consumer and Restaurant Behavior. Obesity. 2017;25(12):2018-2044. doi:10.1002/oby.21940
5. Kiszko KM, Martinez OD, Abrams C, Elbel B. The Influence of Calorie Labeling on Food Orders and Consumption: A Review of the Literature. J Community Health. 2014;39(6):1248-1269. doi:10.1007/s10900-014-9876-0
6. Skov LR, Lourenço S, Hansen GL, Mikkelsen BE, Schofield C. Choice architecture as a means to change eating behaviour in self-service settings: A systematic review. Obes Rev. 2013;14(3):187-196. doi:10.1111/j.1467-789X.2012.01054.x
7. Chen R, Smyser M, Chan N, Ta M, Saelens BE, Krieger J. Changes in awareness and use of calorie information after mandatory menu labeling in restaurants in King County, Washington. Am J Public Health. 2015;105(3):546-553. doi:10.2105/AJPH.2014.302262
8. FARECheck - Food Safety for Allergies | FARE.
9. New York City Department of Health and Mental Hygiene. New Sodium (Salt) Warning Rule: What Food Service Establishments Need to Know.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N03 REFINED INGREDIENTS | O (MAX : 2 PT)

Intent : Help individuals avoid highly processed foods and refined ingredients.

Summary : This WELL feature requires adequately limiting sugar and refined grains in all foods and beverages.

Issue : Poor diets, characterized by highly processed foods with added sugars, refined grains and *trans* fats, are the second-leading risk factor for mortality and morbidity globally, accounting for 8% of all deaths and contributing to an estimated 9.6% of the global burden of disease.[1] Sugar consumption, especially added sugar, has been associated with poor diet quality, an increased risk of heart disease, obesity and tooth decay.[2–4] Refining grains removes most of their vitamins, minerals and dietary fiber. Dietary fiber has been linked to a lower risk of heart disease, stroke, hypertension, diabetes and obesity and is associated with improved digestive health.[5]

Solutions : Increasing access to healthier food items includes increasing the availability of healthier alternatives, as well as limiting the availability of highly processed foods. Based on recommendations by the World Health Organization (WHO), on average, adults should consume no more than 25 grams of added sugar per day.[2] Limiting intake of sugar-sweetened beverages and sugary foods can help individuals meet the WHO sugar recommendations and reduce their daily sugar intake. Promoting the consumption of whole grains by increasing whole grain options can also help individuals increase their intake of dietary fiber.[4,6]

PART 1 LIMIT TOTAL SUGARS (MAX : 1 PT)

For All Spaces:

Foods and beverages are sold or provided by (or under contract with) the project owner on a daily basis and meet the following requirements:

a. Beverages do not contain more than 25 g of sugar per container or serving.[2]

b. At least 25% of beverages contain no sugar per container or serving, or drinking water is available at no cost.

c. Non-beverage food items (except whole fruit) do not contain more than 25 g of sugar per serving.[2]

PART 2 PROMOTE WHOLE GRAINS (MAX : 1 PT)

For All Spaces:

Grain-based foods are sold or provided by (or under contract with) the project owner on a daily basis and meet the following requirements:

a. In at least 50% of grain-based foods (foods that have a grain flour as the first ingredient or that contain ≥30% grain ingredients), a whole grain is the first ingredient.[7]

b. If both whole-grain and refined-grain options are available, whole-grain options do not cost more than their refined-grain counterparts (e.g., brown rice does not cost more than white rice).

Note : Projects must have at least one whole grain option at each food outlet (if grain-based foods are sold or provided) but the 50% calculation may be considered across the entire food service operation (per food category or total number of grain-based foods).

REFERENCES

1. Gakidou E, Afshin A, Abajobir AA, et al. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016. Lancet. 2017;390(10100):1345-1422. doi:10.1016/S0140-6736(17)32366-8
2. World Health Organization. Guideline: Sugars intake for adults and children. 2015. http://www.who.int/nutrition/publications/guidelines/sugars_intake/en/.
3. Malik VS, Popkin BM, Bray GA, Despres J-P, Hu FB. Sugar-Sweetened Beverages, Obesity, Type 2 Diabetes Mellitus, and Cardiovascular Disease Risk. Circulation. 2010;121(11):1356-1364. doi:10.1161/CIRCULATIONAHA.109.876185
4. Eckel RH, Jakicic JM, Ard JD, et al. 2013 AHA/ACC guideline on lifestyle management to reduce cardiovascular risk: A report of the American College of cardiology/American Heart Association task force on practice guidelines. Circulation. 2014;129(25 SUPPL. 1):S76-99. doi:10.1161/01.cir.0000437740.48606.d1
5. Anderson JW, Baird P, Davis RH, et al. Health benefits of dietary fiber. Nutr Rev. 2009;67(4):188-205. doi:10.1111/j.1753-4887.2009.00189.x
6. World Health Organization. Diet, nutrition and the prevention of chronic diseases-Report of the joint WHO/FAO expert consultation. 2003. http://www.who.int/dietphysicalactivity/publications/trs916/intro/en/.
7. Food Service Guidelines Federal Working Group. Food Service Guidelines for Federal Facilities. 2017. Reference.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N04 FOOD ADVERTISING | O (MAX : 1 PT)

Intent : Encourage the selection and consumption of healthier food choices through advertising and messaging.

Summary : This WELL feature requires healthy food advertising and nutritional messaging.

Issue : Billions of dollars are spent annually on food marketing and advertising around the world to overwhelmingly promote highly processed products, including sugar-sweetened beverages, breakfast cereals and fast foods.[1] Food advertising and marketing is ubiquitous and takes several forms, including direct and indirect advertising, product sale contracts and sponsored materials. Children and youth are particularly susceptible to food advertising.[2] Research has found a strong association between advertising for non-nutritious foods and children's behavioral and mental health.[2] Exposure to unhealthy food advertising increases food consumption in children but not adults. [3] Moreover, the marketing and advertising of high-calorie, low-nutrient foods and beverages increases children's preference and intake of unhealthy foods and beverages.[4] In adults, exposure to food advertising is shown to influence food choices and eating behaviors.[5]

Solutions : Healthy food advertising has been shown to increase the selection of healthier items and may have a stronger impact than anti-obesity advertising on shaping eating behaviors.[6] These interventions have been effective in a variety of food settings including, cafeterias, corner stores, grocery stores and supermarkets. [7–11]

PART 1 OPTIMIZE FOOD ADVERTISING (MAX : 1 PT)

For All Spaces:

1: Food advertising

If foods and beverages are sold or provided on a daily basis by (or under contract with) the project owner, the following requirements are met:

a. Sugar-sweetened beverages are not advertised or promoted.[12]

b. Deep-fried food options are not advertised or promoted.[13]

c. Deep-fried food options are not displayed under heat lamps.

2: Nutritional messaging

All dedicated eating spaces and points of sale contain at least two different instances of messaging that promote one of the following:

a. The consumption of fruits and vegetables.[13]

b. The consumption of drinking water.[14,15]

REFERENCES

1. Yale Rudd Center for Food Policy & Obesity. Fast Food Facts 2013. http://www.rwjf.org/en/library/research/2013/11/fast-food-facts-2013.html. Published 2013.
2. Smith R, Kelly B, Yeatman H, Boyland E. Food marketing influences children's attitudes, preferences and consumption: A systematic critical review. Nutrients. 2019;11(4). doi:10.3390/nu11040875
3. Boyland EJ, Nolan S, Kelly B, et al. Advertising as a cue to consume: A systematic review and meta-analysis of the effects of acute exposure to unhealthy food and nonalcoholic beverage advertising on intake in children and adults. Am J Clin Nutr. 2016;103(2):519-533. doi:10.3945/ajcn.115.120022
4. Sadeghirad B, Duhaney T, Motaghipisheh S, Campbell NRC, Johnston BC. Influence of unhealthy food and beverage marketing on children's dietary intake and preference: a systematic review and meta-analysis of randomized trials. Obes Rev. 2016;17(10):945-959. doi:10.1111/obr.12445
5. Boswell RG, Kober H. Food cue reactivity and craving predict eating and weight gain: A meta-analytic review. Obes Rev. 2016;17(2):159-177. doi:10.1111/obr.12354
6. Rusmevichientong P, Streletskaya NA, Amatyakul W, Kaiser HM. The impact of food advertisements on changing eating behaviors: An experimental study. Food Policy. 2014;44:59-67. doi:10.1016/j.foodpol.2013.10.011
7. Foster GD, Karpyn A, Wojtanowski AC, et al. Placement and promotion strategies to increase sales of healthier products in supermarkets in low-income, ethnically diverse neighborhoods: A randomized controlled trial. Am J Clin Nutr. 2014;99(6):1359-1368. doi:10.3945/ajcn.113.075572
8. Glanz K, Bader MDM, Iyer S. Retail grocery store marketing strategies and obesity: An integrative review. Am J Prev Med. 2012;42(5):503-512. doi:10.1016/j.amepre.2012.01.013
9. Cavanaugh E, Green S, Mallya G, Tierney A, Brensinger C, Glanz K. Changes in food and beverage environments after an urban corner store intervention. Prev Med (Baltim). 2014;65:7-12. doi:10.1016/j.ypmed.2014.04.009
10. Dannefer R, Williams DA, Baronberg S, Silver L. Healthy bodegas: Increasing and promoting healthy foods at corner stores in New York City. Am J Public Health. 2012;102(10):e27-e31. doi:10.2105/AJPH.2011.300615
11. Thorndike AN, Riis J, Sonnenberg LM, Levy DE. Traffic-light labels and choice architecture: Promoting healthy

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

food choices. Am J Prev Med. 2014;46(2):143-149. doi:10.1016/j.amepre.2013.10.002

12. von Philipsborn P, Stratil JM, Burns J, et al. Environmental interventions to reduce the consumption of sugar-sweetened beverages and their effects on health. Cochrane Database Syst Rev. 2016;2016(7). doi:10.1002/14651858.CD012292
13. U.S. Department of Health and Human Services. Health and Sustainability Guidelines for Federal Concessions and Vending Operations. General Services Administration, ed. 2012. https://www.gsa.gov/portal/getMediaData?mediaId=239667.
14. Centers for Disease Control and Prevention. Increasing Access to Drinking Water in Schools. 2014. https://www.cdc.gov/healthyschools/npao/pdf/water_access_in_schools_508.pdf.
15. Huang TT-K, Sorensen D, Davis S, et al. Healthy Eating Design Guidelines for School Architecture. Prev Chronic Dis. 2013;10(2):120084. doi:10.5888/pcd10.120084

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N05 ARTIFICIAL INGREDIENTS | O (MAX : 1 PT)

Intent : Help individuals avoid artificial colors, flavors, sweeteners and preservatives in foods and beverages.

Summary : This WELL feature requires projects to label and phase out or restrict artificial ingredients.

Issue : Numerous artificial ingredients are typically added to highly processed foods to improve taste and extend shelf life.[1]However, since these additives do not add nutritional value to a food and tend to appear in foods with low nutritional quality, they should be avoided as often as possible. While some artificial ingredients do not carry immediate health risks, they may become toxic when consumed in large quantities and many have not been evaluated for their effects on metabolic regulation or potential contributions to obesity.[2] Certain artificial dyes that are approved for use in the U.S. may also be carcinogenic, cause hypersensitivity reactions and behavioral problems or be inadequately tested.[3] In the EU, for example, foods that contain artificial dyes are required to carry label warnings that they may cause hyperactivity in children.[4,5]

Solutions : Sourcing packaged foods and beverages without artificial colors, flavors, sweeteners and preservatives can help limit artificial ingredient consumption, as well as promote a diet of whole, natural foods. Labeling and phasing out the use of artificial ingredients that have been deemed ingredients of concern is another way to help individuals avoid consumption of additives. Fortunately, many food companies are phasing out artificial ingredients or reformulating recipes to remove them, a trend partly driven by growing consumer demand and an increased desire for nutritional transparency.[6]

PART 1 LIMIT ARTIFICIAL INGREDIENTS (MAX : 1 PT)

For All Spaces:

Option 1: Artificial ingredient phase out

Foods and beverages are sold or provided by (or under contract with) the project owner on a daily basis and meet the following requirements:

a. The project phases out (over a maximum of three years) the use, sale and provision of foods and beverages containing the following artificial ingredients:

Colorings	Blue 1 (E133), Blue 2 (E132), Green 3, Orange B, Citrus Red 2, Red 3 (E127), Red 40 (E129), Yellow 5 (E102), Yellow 6 (E110), carmine, cochineal, caramel coloring
Sweeteners	acesulfame-potassium (acesulfame-k), advantame, aspartame, calcium saccharin, saccharin, sucralose, cyclamate, neotame, polydextrose
Preservatives	sodium nitrate, sodium nitrite, potassium bromate, potassium iodate, propyl gallate, BHA (butylated hydroxyanisole), BHT (butylated hydroxytoluene), TBHQ, sodium benzoate
Fats & Oils	BVO (brominated vegetable oil), partially hydrogenated oil, olestra

b. Foods and beverages are clearly labeled on packaging, nearby menus or signage to indicate whether they contain artificial ingredients listed in the table above.

OR

Option 2: Artificial ingredient restriction

The following requirements are met:

a.

All foods and beverages sold or provided by (or under contract with) the project owner on a daily basis do not contain artificial ingredients listed in the table below:

Colorings	Blue 1 (E133), Blue 2 (E132), Green 3, Orange B, Citrus Red 2, Red 3 (E127), Red 40 (E129), Yellow 5 (E102), Yellow 6 (E110), carmine, cochineal, caramel coloring
Sweeteners	acesulfame-potassium (acesulfame-k), advantame, aspartame, calcium saccharin, saccharin, sucralose, cyclamate, neotame, polydextrose
Preservatives	sodium nitrate, sodium nitrite, potassium bromate, potassium iodate, propyl gallate, BHA (butylated hydroxyanisole), BHT (butylated hydroxytoluene), TBHQ, sodium benzoate
Fats & Oils	BVO (brominated vegetable oil), partially hydrogenated oil, olestra

REFERENCES

1. U.S. Food and Drug Administration. Overview of Food Ingredients, Additives & Colors. https://www.fda.gov/food/ingredientspackaginglabeling/foodadditivesingredients/ucm094211.htm. Published 2010. Accessed January 21, 2018.
2. Simmons AL, Schlezinger JJ, Corkey BE. What Are We Putting in Our Food That Is Making Us Fat? Food Additives, Contaminants, and Other Putative Contributors to Obesity. Curr Obes Rep. 2014;3(2):273-285. doi:10.1007/s13679-014-0094-y
3. Center for Science in the Public Interest. Food Dyes: A Rainbow of Risks. Decis Sci. 2010. https://cspinet.org/sites/default/files/attachment/food-dyes-rainbow-of-risks.pdf.
4. Center for Science in the Public Interest. The Science Linking Food Dyes with Impacts on Children's Behavior. https://cspinet.org/resource/science-linking-food-dyes-impacts-childrens-behavior. Published 2016. Accessed February 17, 2018.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

5. Food Standards Agency. Food additives. https://www.food.gov.uk/safety-hygiene/food-additives. Published 2018. Accessed January 1, 2018.
6. The Nielsen Company. What's in Our Food and on Our Mind: Ingredient and Dining-Out Trends Around the World.; 2016. http://www.nielsen.com/content/dam/nielsenglobal/eu/docs/pdf/Global Ingredient and Out-of-Home Dining Trends Report FINAL (1).pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N06 PORTION SIZES | O (MAX : 1 PT)

Intent : Promote healthy portion sizes and reduce unintended overconsumption and food waste.

Summary : This WELL feature requires reduced-size food options when food is sold or provided and limits dishware sizes when food is self-serve.

Issue : The portion and packaging sizes of many foods have increased significantly over the last 30 years along with rising global obesity rates.[1,2] Research suggests that individuals consistently consume more food and drink when offered larger-sized portions, packages or tableware, than when offered smaller- sized versions.[3] Larger packaging, meal sizes and dishware sizes are possible contributors to growing portion sizes, especially when portion and serving sizes do not align.

Solutions : Smaller portion size options for meals and individual food items can encourage reasonable portions without infringing on individual choice. [4–6] Reducing the portion size of foods and beverages that are not nutrient dense, such as processed foods, can help individuals maintain calorie balance and reduce added sugar consumption.[7] Dishware sizes can also be adjusted to promote healthier portion sizes. Larger dishware is associated with larger self-served portions and greater energy intake in both adults and children.[3,8,9] Individuals also tend to underestimate the quantity of food when it is presented on a larger plate and overestimate the quantity when it is presented on a smaller plate.[10,11] Though the effect of plate size may vary based on an individual's body weight or gender, it may have more influence when purposely used to guide appropriate portions.[8,12,13]

PART 1 PROMOTE HEALTHY PORTIONS (MAX : 1 PT)

For Commercial Dining Spaces:

Foods and beverages are sold or provided by (or under contract with) the project owner on a daily basis and meet the following requirements:

a. All standard menu items do not contain more than 650 Cal, or a version or portion of the standard menu item is available at a smaller size and lower cost for at least 50% of all standard menu items containing more than 650 Cal.

b. Where food is self-serve (e.g., buffet), dishware does not exceed the following sizes per occupant type:

Dishware	Primary School Students	Secondary School Students	Adults
Circular plates, diameter	8 in	10 in	10 in
Non-circular plates, surface area	49 in^2	79 in^2	79 in^2
Bowls, volume	8 fl oz	12 fl oz	16 fl oz
Cups, volume	8 fl oz	12 fl oz	16 fl oz

REFERENCES

1. Duffey KJ, Popkin BM. Energy density, portion size, and eating occasions: Contributions to increased energy intake in the United States, 1977-2006. Ludwig D, ed. PLoS Med. 2011;8(6):e1001050-e1001050. doi:10.1371/journal.pmed.1001050
2. Nielsen SJ, Popkin BM. Patterns and trends in food portion sizes, 1977-1998. J Am Med Assoc. 2003;289(4):450-453. doi:10.1001/jama.289.4.450
3. Hollands GJ, Shemilt I, Marteau TM, et al. Portion, package or tableware size for changing selection and consumption of food, alcohol and tobacco. Hollands GJ, ed. Cochrane Database Syst Rev. 2014;2014(4). doi:10.1002/14651858.CD011045
4. American Heart Association, American Stroke Association. American Heart Association Healthy Workplace Food & Beverage Toolkit. 2015. https://www.heart.org/idc/groups/heart-public/@wcm/@fc/documents/downloadable/ucm_465693.pdf.
5. Food Service Guidelines Federal Working Group. Food Service Guidelines for Federal Facilities. 2017. Reference.
6. U.S. Department of Health and Human Services. Health and Sustainability Guidelines for Federal Concessions and Vending Operations. General Services Administration, ed. 2012. https://www.gsa.gov/portal/getMediaData?mediaId=239667.
7. U.S. Department of Health and Human Services, U.S. Department of Agriculture. Dietary Guidelines for Americans, 2015-2020. 2015. https://health.gov/dietaryguidelines/2015/resources/2015-2020_Dietary_Guidelines.pdf.
8. Peng M. How does plate size affect estimated satiation and intake for individuals in normal-weight and overweight groups? Obes Sci Pract. 2017;3(3):282-288. doi:10.1002/osp4.119
9. DiSantis KI, Birch LL, Davey A, et al. Plate Size and Children's Appetite: Effects of Larger Dishware on Self-Served Portions and Intake. Pediatrics. 2013;131(5):e1451-e1458. doi:10.1542/peds.2012-2330
10. Wansink B. Environmental Factors That Increase the Food Intake and Consumption Volume of Unknowing Consumers. Annu Rev Nutr. 2004;24(1):455-479. doi:10.1146/annurev.nutr.24.012003.132140
11. Wansink B, van Ittersum K, Painter JE. Ice Cream Illusions. Bowls, Spoons, and Self-Served Portion Sizes. Am J Prev Med. 2006;31(3):240-243. doi:10.1016/j.amepre.2006.04.003

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

12. Robinson E, Nolan S, Tudur-Smith C, et al. Will smaller plates lead to smaller waists? A systematic review and meta-analysis of the effect that experimental manipulation of dishware size has on energy consumption. Obes Rev. 2014;15(10):812-821. doi:10.1111/obr.12200
13. Yip W, Wiessing KR, Budgett S, Poppitt SD. Using a smaller dining plate does not suppress food intake from a buffet lunch meal in overweight, unrestrained women. Appetite. 2013;69:102-107. doi:10.1016/j.appet.2013.05.017

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N07 NUTRITION EDUCATION | O (MAX : 1 PT)

Intent : Support a healthy eating pattern by increasing nutritional knowledge and food literacy.

Summary :
This WELL feature requires the provision of nutrition education.

Issue : Food literacy is defined as an individual's ability to not only understand nutrition information but also to implement this knowledge into their diet through preparation and cooking of food and healthy meals.[1] Studies report a positive relationship between food literacy levels and healthy dietary intake. Unfortunately, due to a global dietary shift away from whole ingredient foods, such as fruits and vegetables, and towards highly processed foods that require little-to-no skill in preparation and cooking, many people lack adequate food literacy to make healthy choices.[2] Therefore, nutrition and food education programs focused on increasing levels of food literacy are important to individual health and well-being. Participation in food and nutrition education programs have been associated with increased fruit and vegetable intake, knowledge of food preparation skills, and improvements in healthy behaviors.[3–7]

Solutions : Nutrition education has been shown to be more effective when focused on changing specific behaviors, rather than only increasing knowledge. [8,9] Nutrition education is also more effective when combined with environmental dietary modifications, such as strategic placement of healthier alternatives, portion size control and menu modifications.[3]Educational programming that includes multiple types of interventions (mixed-method programming) and that is on-going or longer term has a greater impact than short-term, single-method interventions.[3,5] The scope of nutrition and food education may also be broader than personal nutrition and health. For example, education can cover topics, such as safe food handling practices, gardening and food production techniques, as well as food preparation skills.

PART 1 PROVIDE NUTRITION EDUCATION (MAX : 1 PT)

For All Spaces:

At least one of the following is offered live (in-person or virtually) to regular occupants at no cost on a quarterly basis at minimum:

a. Cooking demonstrations led by chef-instructors that include fruits and/or vegetables, demonstrate cooking skills and integrate hands-on learning opportunities.

b. Nutrition or dietary education sessions led by an accredited dietitian or accredited nutritionist.

c. Individual nutrition consultations led by an accredited dietitian or accredited nutritionist.

d. Gardening or planting workshops focused on edible plants that integrate hands-on learning opportunities.

REFERENCES

1. Vaitkeviciute R, Ball LE, Harris N. The relationship between food literacy and dietary intake in adolescents: A systematic review. *Public Health Nutr*. 2015;18(4):649-658. doi:10.1017/S1368980014000962
2. Douwes J, Thorne P, Pearce N, Heederik D. Bioaerosol health effects and exposure assessment: Progress and prospects. *Ann Occup Hyg*. 2003;47(3):187-200. doi:10.1093/annhyg/meg032
3. Geaney F, Kelly C, Di Marrazzo JS, et al. The effect of complex workplace dietary interventions on employees' dietary intakes, nutrition knowledge and health status: A cluster controlled trial. *Prev Med (Baltim)*. 2016;89:76-83. doi:10.1016/j.ypmed.2016.05.005
4. Long Valerie, Cates Sheryl, Blitstein Jonathan, et al. Supplemental Nutrition Assistance Program Education and Evaluation Study (Wave II). 2013. https://fns-prod.azureedge.net/sites/default/files/SNAPEdWaveII.pdf.
5. Pem D, Jeewon R. Fruit and Vegetable Intake: Benefits and Progress of Nutrition Education Interventions-Narrative Review Article. *Iran J Public Health*. 2015;44(10):1309-1321.
6. Reicks M et al. Impact of cooking and home food preparation interventions among adults: A systematic review (2011–2016). *J Nutr Educ Behav*. 2018;50(2):148-172.
7. Goh LML, Wong AXY, Ang GY, Tan ASL. Effectiveness of nutrition education accompanied by cooking demonstration. *Br Food J*. 2017;119(5):1052-1066. doi:10.1108/BFJ-10-2016-0464
8. Murimi MW, Kanyi M, Mupfudze T, Amin M, Mbogori T, Aldubayan K. Factors Influencing Efficacy of Nutrition Education Interventions: A Systematic Review. *J Nutr Educ Behav*. 2017;49(2):142-165.e1. doi:10.1016/j.jneb.2016.09.003
9. Murimi MW, Moyeda-Carabaza AF, Nguyen B, Saha S, Amin R, Njike V. Factors that contribute to effective nutrition education interventions in children: a systematic review. *Nutr Rev*. 2018;76(8):553-580. doi:10.1093/nutrit/nuy020

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N08 MINDFUL EATING | O (MAX : 2 PT)

Intent : Encourage mindful eating behaviors and communal dining opportunities.

Summary : This WELL feature requires dedicated eating space that contains tables and chairs and the provision of daily meal breaks.

Issue : Our eating behaviors are influenced by a variety of factors that extend beyond just hunger. Additional factors - economic, social, psychological and environmental also shape our food choice. Recently, eating alone and distracted eating have become emerging social concerns and are associated with a variety of social and health outcomes. Studies have found that people who tend to eat alone may be more likely to choose unhealthier foods, eat fewer fruits and vegetables and eat at irregular times.[1]Eating alone may also be a potential risk factor for metabolic syndrome, a group of risk factors that increase the risk of heart disease, stroke and diabetes.[2,3] There is also some evidence to indicate that distracted eating while working, reading, watching television or listening to music is associated with higher food intake both immediately and later on.[4]

Solutions : Eating attentively and placing focus on the process of eating may lead to better control of one's food intake. A positive relationship also exists between mindful eating and mental well-being.[4] The provision of dedicated eating spaces can encourage individuals to enjoy meals together, prevent distracted eating at workstations and lead to better eating habits. In addition to eating spaces, having designated meal periods can help ensure individuals have and take time to eat meals mindfully.

PART 1 SUPPORT MINDFUL EATING (MAX : 2 PT)

For All Spaces except Dwelling Units:

1: Dedicated eating space

A dedicated eating space is located within a 650 ft walk distance of the project boundary and meets the following requirements:

a. Contains tables and chairs to accommodate at least 25% of regular occupants at peak occupancy. If multiple dedicated eating spaces are present, the combined seating space must accommodate at least 25% of regular occupants at peak occupancy.

b. Provides protection from environmental elements (e.g., direct sunlight, rain, wind) or is in a climate-controlled space.

c. Accommodates a variety of seating arrangements, including small group (up to 4 people) and large group (more than 4 people) seating.

2: Daily meal breaks

The following requirement is met:

a. Eligible employees and students (as applicable) have a daily meal break of at least 30 minutes.

REFERENCES

1. Conklin AI, Forouhi NG, Surtees P, Khaw KT, Wareham NJ, Monsivais P. Social relationships and healthful dietary behaviour: Evidence from over-50s in the EPIC cohort, UK. Soc Sci Med. 2014;100:167-175. doi:10.1016/j.socscimed.2013.08.018
2. Kwon RA, Yoon YS, Min KP, Lee YK, Jeon JH. Eating alone and metabolic syndrome: A population-based Korean National Health and Nutrition Examination Survey 2013–2014. Obes Res Clin Pract. 2017. doi:https://doi.org/10.1016/j.orcp.2017.09.002
3. Kim C-K, Kim H-J, Chung H-K, Shin D. Eating alone is differentially associated with the risk of metabolic syndrome in Korean men and women. Int J Environ Res Public Health. 2018;15(5). doi:10.3390/ijerph15051020
4. Robinson E, Aveyard P, Daley A, et al. Eating attentively: A systematic review and meta-analysis of the effect of food intake memory and awareness on eating. Am J Clin Nutr. 2013;97(4):728-742. doi:10.3945/ajcn.112.045245

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N09 SPECIAL DIETS | O (MAX : 2 PT)

Intent : Provide alternative food choices to individuals with dietary restrictions, food allergies or intolerances, and label common food allergens.

Summary : This WELL feature requires the provision of meal alternatives and food allergen labeling.

Issue : Individuals with food allergies, intolerances or dietary restrictions may encounter difficulty in finding suitable meal options outside of the home setting. The World Allergy Organization reports that the prevalence of food allergies is increasing in countries around the world.[1] A growing number of individuals are also omitting certain ingredients or following special diets for a variety of personal, health, social and environmental reasons.[2] Such dietary exclusion or restriction may have nutritional consequences and lead to a nutritionally deficient diet.[3,4] Dietary guidelines increasingly recognize a variety of healthy eating patterns, such as the Mediterranean-style and vegetarian eating patterns, that can help ensure an individual's diet is both nutritionally adequate and enjoyable.[5]

Solutions : Meal alternatives for common food allergies or intolerances and dietary restrictions can help support individual dietary preferences and ensure the availability of meal options and balanced meals for everyone. Alternatives can minimize the stress and worry associated with food and dietary restrictions. Suitable meal options can also minimize the risk of individuals consuming potentially harmful foods. To further support individuals with special dietary needs, alternative food items can be offered at the same or similar price as standard items. Ingredient transparency through accurate food allergen labeling can help individuals identify and avoid potential allergens.

PART 1 ACCOMMODATE SPECIAL DIETS (MAX : 1 PT)

For All Spaces:

Meals with main dishes are sold or provided by (or under contract with) the project owner on a daily basis and include at least one option that meets the following requirements:

a. Does not contain peanut and tree nuts.

b. Does not contain gluten and wheat.

c. Does not contain soy.

d. Does not contain sesame.

e. Does not contain animal products, including seafood, dairy, and eggs.

PART 2 LABEL FOOD ALLERGENS AND INTOLERANCES (MAX : 1 PT)

For All Spaces:

Foods and beverages are sold or provided by (or under contract with) the project owner and all foods and beverages are clearly labeled at point-of-decision (e.g., on packaging, menus, signage) to indicate if they contain the following common food allergens and intolerances:[6]

a. Peanut.

b. Fish.

c. Shellfish.

d. Soy.

e. Milk.

f. Egg.

g. Wheat.

h. Tree nuts.

i. Sesame.

j. Gluten.

REFERENCES

1. Prescott SL, Pawankar R, Allen KJ, et al. A global survey of changing patterns of food allergy burden in children. World Allergy Organ J. 2013;6(1):21. doi:10.1186/1939-4551-6-21
2. The Nielsen Company. What's in Our Food and on Our Mind: Ingredient and Dining-Out Trends Around the World.; 2016. http://www.nielsen.com/content/dam/nielsenglobal/eu/docs/pdf/Global Ingredient and Out-of-Home Dining Trends Report FINAL (1).pdf.
3. Theethira TG, Dennis M, Leffler DA. Nutritional consequences of celiac disease and the gluten-free diet. Expert Rev Gastroenterol Hepatol. 2014;8(2):123-129. doi:10.1586/17474124.2014.876360
4. Steinman H. Nutritional implications of food allergies. South African J Clin Nutr. 2010;23(1 SUPPL.):S37-S41. http://www.scopus.com/inward/record.url?eid=2-s2.0-77958006459&partnerID=40&md5=afcdcfe458e9a999b8dcee3d69be8540.
5. U.S. Department of Health and Human Services, U.S. Department of Agriculture. Dietary Guidelines for Americans, 2015-2020. 2015. https://health.gov/dietaryguidelines/2015/resources/2015-2020_Dietary_Guidelines.pdf.
6. Food Allergens - International Regulatory Chart | FARRP | Nebraska.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N10 FOOD PREPARATION | O (MAX : 1 PT)

Intent : Provide space and supportive amenities for the preparation of meals on-site.

Summary : This WELL feature requires a food preparation area, storage space and other amenities to support the reassembly or reheating of meals on-site.

Issue : Consumption of foods away from home has steadily increased since the 1970s.[1] This is a concerning trend, since meals consumed away from home are often higher in calories, lower in nutrients and larger in portion size.[2] Emerging research has found an association between eating away from home and a higher BMI and lower fruit and vegetable consumption in adults.[3] Analysis of dietary intake data also shows that individuals who bring food from home tend to have a better diet quality than individuals who purchase food away from home.[2] In addition to nutritional benefits, preparing meals at home has financial benefits. Frequent home cooking is linked to reduced food expenditures, whereas frequently eating away from home is associated with higher food expenditures.[4]

Solutions : Spaces that allow individuals to reheat or assemble food prepared at home can support healthy eating habits and cooking skills. Sufficient cold storage space can help ensure safe food storage for individuals who bring meals from home. Other supportive amenities, such as eating utensils and devices for reheating food can make it even easier for individuals to consume homemade meals and encourage healthy eating patterns.

PART 1 PROVIDE MEAL SUPPORT (MAX : 1 PT)

For All Spaces except Dwelling Units, Commercial Kitchen Spaces & Guest Rooms:

The following supportive amenities are provided in a quantity that meets employee demand in at least one dedicated eating area within a 650 ft walk distance of the project boundary:

a. Cold storage.

b. Countertop surface.

c. Sink and amenities for dish and hand washing.

d. Device for reheating food (e.g., toaster oven, microwave).

e. Dedicated cabinets or storage units available for employee use.

f. Non-plastic plates, bowls and cups.

g. Spoons, forks and knives.

h. Cans/bins for garbage, recycling and/or compost.

For Dwelling Units:

The following supportive amenities are provided:

a. Countertop surface.

b. Sink.

c. Refrigerator.

d. Cabinets.

e. Stove with hood vented directly to the outdoors.

For Guest Rooms:

The following are available for guest use in each guestroom:

a. Refrigerator/mini-fridge (not counting refrigerators dedicated to items that can be purchased).

b. Microwave oven.

c. Bowls, cups and utensils, including spoons, forks and knives.

d. Dish soap.

REFERENCES

1. Guthrie JF, Lin BH, Frazao E. Role of food prepared away from home in the American diet, 1977-78 versus 1994-96: Changes and consequences. J Nutr Educ Behav. 2002;34(3):140-150. doi:10.1016/S1499-4046(06)60083-3
2. Todd JE, Mancino L, Lin B-H. The Impact of Food Away from Home on Adult Diet Quality. Ssrn. 2010. doi:10.2139/ssrn.1557129
3. Seguin RA, Aggarwal A, Vermeylen F, Drewnowski A. Consumption Frequency of Foods Away from Home Linked with Higher Body Mass Index and Lower Fruit and Vegetable Intake among Adults: A Cross-Sectional Study. J Environ Public Health. 2016;2016. doi:10.1155/2016/3074241
4. Tiwari A, Aggarwal A, Tang W, Drewnowski A. Cooking at Home: A Strategy to Comply With U.S. Dietary Guidelines at No Extra Cost. Am J Prev Med. 2017;52(5):616-624. doi:10.1016/j.amepre.2017.01.017

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N11 RESPONSIBLE FOOD SOURCING | O (MAX : 1 PT)

Intent : Reduce dietary exposure to pesticides, hormones and antibiotics, limit environmental degradation and promote humane livestock practices.

Summary : This WELL feature requires sourcing and labeling certified organic and certified sustainable foods.

Issue : The use of antibiotics and hormones on animals and pesticides on produce is a global threat to public health and the ability to treat infectious diseases. Studies have confirmed that the use of antibiotics in agriculture and animals contributes to the development of antibiotic resistance in humans, and dietary pesticide exposure has been associated with adverse reproductive consequences in women and men.[1–4] The consumption of certain pesticides has also been linked to an increased risk for some types of cancer, and pregnant women exposed to higher amounts of pesticides have given birth to children with lower IQ.[5–7]

Solutions : Responsible sourcing practices and policies can help promote sustainable food purchasing, encourage humane animal treatment, and consider broader social and environmental impacts. While organically grown foods may not be significantly more nutritious than conventionally grown foods, organic produce has been shown to have lower levels of pesticide residue and organic chicken and pork are less likely to contain antibiotic-resistant bacteria than conventional food.[8] Animal welfare standards serve to ensure that animals are raised in humane conditions and address topics such as space allowance, transportation, feed and outdoor access provided for farm animals.[9] Humane practices also limit the use of antibiotics and hormones on animals. Labeling organic and humanely raised foods can help individuals quickly identify these products, as well as promote local farms and organizations.

PART 1 IMPLEMENT RESPONSIBLE SOURCING (MAX : 1 PT)

For All Spaces:

1: Sustainable sourcing

Foods and beverages are sold or provided by (or under contract with) the project owner on a daily basis and the total product line meets the following criteria:

a. At least 50% of the total produce line (fruits and vegetables) is certified organic.[10]

b. At least 25% of the total animal product line (meat, seafood, egg and dairy products) is certified organic, Certified Humane® or certified by a GSSI-recognized Seafood Certification Scheme.[9,10]

2: Sustainable labeling

Sustainable and humane agriculture is promoted through the following, as applicable:

a.

Certified organic and sustainable products are labeled at point-of-decision.

b.

Local farms or sources are advertised at point-of-decision for locally sourced foods.

REFERENCES

1. Paulson JA, Zaoutis TE. Nontherapeutic Use of Antimicrobial Agents in Animal Agriculture: Implications for Pediatrics. Pediatrics. 2015;136(6):e1670-e1677. doi:10.1542/peds.2015-3630
2. Smith DL, Dushoff J, Morris JG. Agricultural antibiotics and human health: Does antibiotic use in agriculture have a greater impact than hospital use? PLoS Med. 2005;2(8):0731-0735. doi:10.1371/journal.pmed.0020232
3. Chiu YH, Afeiche MC, Gaskins AJ, et al. Fruit and vegetable intake and their pesticide residues in relation to semen quality among men from a fertility clinic. Hum Reprod. 2015;30(6):1342-1351. doi:10.1093/humrep/dev064
4. Chiu YH, Williams PL, Gillman MW, et al. Association between pesticide residue intake from consumption of fruits and vegetables and pregnancy outcomes among women undergoing infertility treatment with assisted reproductive technology. JAMA Intern Med. 2018;178(1):17-26. doi:10.1001/jamainternmed.2017.5038
5. Bouchard MF, Chevrier J, Harley KG, et al. Prenatal exposure to organophosphate pesticides and IQ in 7-year-old children. Environ Health Perspect. 2011;119(8):1189-1195. doi:10.1289/ehp.1003185
6. Rauh V, Arunajadai S, Horton M, et al. Seven-year neurodevelopmental scores and prenatal exposure to chlorpyrifos, a common agricultural pesticide. Environ Health Perspect. 2011;119(8):1196-1201. doi:10.1289/ehp.1003160
7. Koutros S, Alavanja MCR, Lubin JH, et al. An update of cancer incidence in the agricultural health study. J Occup Environ Med. 2010;52(11):1098-1105. doi:10.1097/JOM.0b013e3181f72b7c
8. Smith-Spangler C, Brandeau ML, Hunter GE, et al. Are organic foods safer or healthier than conventional alternatives?: A systematic review. Ann Intern Med. 2012;157(5):348-366. doi:10.7326/0003-4819-157-5-201209040-00007
9. Humane Certified. Humane Farm Animal Care Comprehensive Animal Welfare Standards Comparison By Program – Chickens, Beef Cattle and Pigs. http://certifiedhumane.org/wp-content/uploads/2014/01/Comp.Standards.Comparison.Chart_.wappendix.11.26.13.pdf.
10. U.S. Department of Agriculture. National Organic Program. https://www.ams.usda.gov/about-ams/programs-offices/national-organic-program. Accessed February 16, 2018.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N12 FOOD PRODUCTION | O (MAX : 2 PT)

Intent : Provide opportunities for on-site food production and increase food access.

Summary : This WELL feature requires the provision of space, infrastructure and tools for on-site food production.

Issue : Changing economic and environmental conditions, along with increasing industrialization, have led to both a physical and emotional disconnect between consumers and their food. Most food is produced or processed hundreds of miles from where it is consumed, often threatening local food systems and contributing to a sense of detachment. More recently, consumers have an increasing desire to know how their food is made, raised or grown, in order to better understand the consequences of their food purchases.[1] This has led to the growth of a global movement committed to reconnecting individuals, communities and local food systems.

Solutions : Increasing availability to locally grown food is important for many reasons, including strengthening food systems and contributing to healthier communities and ecosystems. Individuals who participate in community and home gardening projects have higher levels of fruit and vegetable consumption and are more likely to meet national recommendations for fruit and vegetable intakes than nongardeners.[2–4] Individual participation in community agriculture has also been linked to increased household fruit and vegetable intake. [2] Beyond contributing to nutritional benefits, gardens are associated with several social benefits. Participation in community gardening can help fortify community cohesion and involvement, increase physical activity, provide on-site educational opportunities and increase perceptions of community safety.[3,5] Gardening may also benefit mental health, by reducing symptoms of anxiety and depression.[6]

PART 1 PROVIDE GARDENING SPACE (MAX : 2 PT)

For All Spaces except Dwelling Units:

A permanent and accessible space for food production is located within a 0.25 mi walk distance of the project boundary and meets the following requirements:

a. The space includes at least one of the following:
    1. Garden or greenhouse with food-bearing plants.[7]
    2. Edible landscaping (e.g., fruit trees, herbs).[7]
    3. Hydroponic or aeroponic farming system.
b. The space is available to regular occupants during the majority of building operating hours. Foods grown are made available to regular occupants.
c. The space is at least 1 ft^2 per regular occupant or 0.5 ft^2 per student, whichever area is greater (up to a maximum of 1,500 ft^2 and not less than 200 ft^2). The area calculated is the actual growing area (vertical or horizontal) used for the production of food-bearing plants.[7] For hydroponic and aeroponic farming systems, the project may halve the growing area calculations, given higher yield.
d. Regular occupants have access to planting supplies, including planting medium, watering system, lighting (interior spaces only), plants and gardening tools.[7]

For Dwelling Units:

A permanent and accessible space for food production is located within a 0.25 mi walk distance of the project boundary and meets the following requirements:

a. The space includes at least one of the following:
    1. Garden or greenhouse with food-bearing plants.[7]
    2. Edible landscaping (e.g., fruit trees, herbs).[7]
    3. Hydroponic or aeroponic farming system.
b. The space is open to regular occupants during regular building hours and is accessible the majority of the days in the operating year. Foods grown are made available to regular occupants.
c. The space is at least 15 ft^2 per dwelling unit (up to a maximum of 1,500 ft^2 and not less than 200 ft^2). The area calculated is the actual growing area (vertical or horizontal) used for the production of food-bearing plants.[7] For hydroponic and aeroponic farming systems, the project may halve the growing area calculations given higher yield.
d. The space provides planting supplies, including planting medium, watering system, lighting (interior spaces only), plants and gardening tools.[7]

REFERENCES

1. The Nielsen Company. What's in Our Food and on Our Mind: Ingredient and Dining-Out Trends Around the World.; 2016. http://www.nielsen.com/content/dam/nielsenglobal/eu/docs/pdf/Global Ingredient and Out-of-Home Dining Trends Report FINAL (1).pdf.
2. Alaimo K, Packnett E, Miles RA, Kruger DJ. Fruit and vegetable intake among urban community gardeners. J Nutr Educ Behav. 2008;40(2):94-101. doi:10.1016/j.jneb.2006.12.003
3. Litt JS, Soobader MJ, Turbin MS, Hale JW, Buchenau M, Marshall JA. The influence of social involvement, neighborhood aesthetics, and community garden participation on fruit and vegetable consumption. Am J Public

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Health. 2011;101(8):1466-1473. doi:10.2105/AJPH.2010.300111

4. Hanbazaza MA, Triador L, Ball GDC, et al. The Impact of School Gardening on Cree Children's Knowledge and Attitudes toward Vegetables and Fruit. Can J Diet Pr Res. 2015;76(3):133-139. doi:10.3148/cjdpr-2015-007
5. Art M. Community gardens to fight urban youth crime and stabilize neighborhoods. Int J Child Heal Hum Dev. 2014;7(3):223-236.
6. Clatworthy J, Hinds J, M. Camic P. Gardening as a mental health intervention: a review. Ment Heal Rev J. 2013;18(4):214-225. doi:10.1108/MHRJ-02-2013-0007
7. U.S. Green Building Council. LEED BD+C: New Construction | v3 - LEED 2009 - Clean construction. 2013.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N13 LOCAL FOOD ENVIRONMENT | O (MAX : 1 PT)

Intent : Encourage the availability and consumption of fresh, local, and seasonal fruits and vegetables through supportive food environments.

Summary : This WELL feature requires projects to take into consideration the local food environment during site selection or programming.

Issue : Dietary patterns around the world are shaped by a combination of personal preferences, traditions, and environmental factors, including the local food environment. The local food environment encompasses the type and density of food retail outlets, including grocery stores and food service outlets, and the consistent availability of healthy, wholesome foods at these venues. However, certain environments have the potential to be more obesogenic than others, promoting weight gain and possibly contributing to obesity.[1] In particular, the presence of smaller grocery stores and fast food establishments influence food choices and is associated with a higher prevalence of obesity.[2]

Solutions : Locating projects within close proximity to supermarkets, grocery stores and farmers markets can help individuals improve their dietary and lifestyle behaviors, through environments that support better food choices.[2,3] Hospitals and healthcare institutions that host farmers' markets and farm stands contribute to healthier nutrition environments by positively impacting fruit and vegetable consumption, an effective model that may be generalizable to other large institutions.[4,5] Beyond farmers' markets, increased healthy food retail outlet density is associated with a lower BMI, while supermarket availability is associated with meeting dietary recommendations.[6–9] Mobile food markets, food carts and fruit and vegetable stands are additional ways to increase access to fruits and vegetables in the environments where individuals live, work and learn.[4]

PART 1 ENSURE LOCAL FOOD ACCESS (MAX : 1 PT)

For All Spaces:

Option 1: Supportive environment

The main building entrance is located within a 0.25 mi walk distance of one of the following:

a. Supermarket or store with a fresh fruit and vegetable section.[10]

b. Farmers' market that is open at least once a week and operates for at least four months of the year.[11]

OR

Option 2: Supportive programming

The project meets one of the following requirements:

a. Serves as a distribution point for a community-based agriculture program that delivers fruits and vegetables at least twice a month for at least four months of the year, in which regular occupants can participate.[11]

b. Hosts the weekly sale of fruits and vegetables (e.g., fruit and vegetable carts or stands, mobile markets) for at least four months of the year.[12]

OR

Option 3: Supportive transportation

The project meets the following requirement:

a. Transportation is provided at no cost between the project and a supermarket and/or store with a fresh fruit and vegetable section and/or farmers market.

REFERENCES

1. Swinburn B, Egger G, Raza F. Dissecting obesogenic environments: The development and application of a framework for identifying and prioritizing environmental interventions for obesity. Prev Med (Baltim). 1999;29(6 I):563-570. doi:10.1006/pmed.1999.0585
2. Morland KB, Evenson KR. Obesity prevalence and the local food environment. Heal Place. 2009;15(2):491-495. doi:10.1016/j.healthplace.2008.09.004
3. U.S. Department of Health and Human Services, U.S. Department of Agriculture. Dietary Guidelines for Americans, 2015-2020. 2015. https://health.gov/dietaryguidelines/2015/resources/2015-2020_Dietary_Guidelines.pdf.
4. Cromp D, Cheadle A, Solomon L, Maring P, Wong E, Reed KM. Kaiser Permanente's Farmers' Market Program: Description, impact, and lessons learned. J Agric. 2011;2(22):29-36. doi:10.5304/jafscd.2012.022.010
5. Freedman DA, Choi SK, Hurley T, Anadu E, Hebert J. A Farmers' Market at a Federally Qualified Health Center Improves Fruit and Vegetable Intake among Low-income Diabetics. Prev Med. 2014;56(5):288-292. doi:10.1016/j.ypmed.2013.01.018.A
6. Lamichhane AP, Puett R, Porter DE, Bottai M, Mayer-Davis EJ, Liese AD. Associations of built food environment with body mass index and waist circumference among youth with diabetes. Int J Behav Nutr Phys Act. 2012;9:81. doi:10.1186/1479-5868-9-81
7. Morland K, Wing S, Roux AD. The Contextual Effect of the Local Food Environment on Resident's Diets: The Atherosclerosis Risk in Communities Study. Am J Public Health. 2001;92(11):1761-1768. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447325/.
8. Moore L V., Diez Roux A V., Nettleton JA, Jacobs DR. Associations of the local food environment with diet quality - A comparison of assessments based on surveys and geographic information systems. Am J Epidemiol. 2008;167(8):917-924. doi:10.1093/aje/kwm394
9. Larson NI, Story MT, Nelson MC. Neighborhood environments: disparities in access to healthy foods in the U.S. Am

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

J Prev Med. 2009;36(1):74-81. doi:10.1016/j.amepre.2008.09.025

10. U.S. Green Building Council. LEED BD+C: Core and Shell | v4 - LEED v4 Surrounding density and diverse uses.
11. U.S. Green Building Council. LEED ND: Plan | v4 - LEED v4 Local food production. https://www.usgbc.org/credits/neighborhood-development-plan-neighborhood-development/v4-draft/npdc13. Accessed March 13, 2018.
12. M Farley S, Sacks R, Dannefer R, et al. Evaluation of the New York City Green Carts program. AIMS Public Heal. 2015;2(4):906-918. doi:10.3934/publichealth.2015.4.906

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

N14 RED AND PROCESSED MEATS | O (MAX : 1 PT)

Intent : Increase the availability of plant-based food options and reposition red and processed meat products to decrease their prominence at point-of-decision.

Summary : This WELL feature requires providing plant-based food options, limiting the portion size of red meat and decreasing the prominence of red and processed meats.

Issue : The consumption of meat, including red and processed meat, has been increasing worldwide, a trend with major health and environmental consequences.[1] In 2015, the World Health Organization classified processed meat as carcinogenic (cancer-causing) and red meat as probably carcinogenic.[2] Processed meat includes meat that has been processed through salting, smoking, curing or other processes to improve flavor or preservation while red meat includes unprocessed mammalian muscle meat such as beef, veal, pork and lamb.[2] Although red meat is a source of protein and minerals and vitamins, such as iron and vitamin B12, many studies show that a high intake of red meat is associated with an increased risk of colorectal cancer, heart disease, diabetes and other chronic diseases.[2–4] Consumption of processed meat is more strongly associated with colorectal cancer and also positively associated with stomach cancer.[2] Globally, food production practices that support the consumption of plant-based foods, including meat alternatives, are more likely to contribute to a sustainable food system and healthier environment for all.[5]

Solutions : Providing plant-based meat alternatives, reducing the portion size of red meat servings and repositioning meat products has the potential to decrease the demand for and consumption of meat.[6] The World Cancer Research Fund recommends that individuals who consume red meat limit their intake to no more than three portions per week (equivalent to 12–18 oz per week) and to avoid eating processed meat.[7] Plant-based protein sources such as nuts, legumes (pulses) and cereals (grains) as well as poultry, fish, eggs and dairy are valuable sources of protein and nutrients and are recommended alternatives to red meat.[7] Smaller portions and leaner cuts of red meat are also encouraged for individuals who normally consume red meat.[7] In food service, chefs and menu developers can help shift eating patterns by positioning red meat as a supplement (side dish) or condiment to plant-based dishes and by limiting processed meat options.[8]

PART 1 LIMIT RED AND PROCESSED MEATS (MAX : 1 PT)

For Commercial Dining Spaces:

Foods and beverages are sold or provided by (or under contract with) the project owner on a daily basis and meet the following requirements, as applicable:

a. At least one plant-based option is available at each food outlet.[8]
b. A single portion or serving of red meat, if sold or provided, is less than 5.3 oz uncooked weight or less than 4 oz cooked weight.[7]
c. Red and processed meats, if sold or provided, are placed at the end of self-serve food service lines.[6]
d. Red and processed meats, if sold or provided, are listed last in each menu section or listed on a separate menu and/or menu board.[9]

REFERENCES

1. Speedy AW. Global production and consumption of animal source foods. J Nutr. 2003;133(11 Suppl 2):4048S-4053S. doi:10.1093/jn/133.11.4048S
2. Bouvard V, Loomis D, Guyton KZ, et al. Carcinogenicity of consumption of red and processed meat. Lancet Oncol. 2015;16(December):1599-1600. doi:10.1016/S1470-2045(15)00444-1
3. Micha R, Wallace SK, Mozaffarian D. Red and processed meat consumption and risk of incident coronary heart disease, stroke, and diabetes mellitus: a systematic review and meta-analysis. Circulation. 2010;121(21):2271-2283. doi:10.1161/CIRCULATIONAHA.109.924977
4. Lippi G, Mattiuzzi C, Cervellin G. Meat consumption and cancer risk: a critical review of published meta-analyses. Crit Rev Oncol Hematol. 2016;97:1-14. doi:10.1016/j.critrevonc.2015.11.008
5. Willett W, Rockström J, Loken B, et al. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. Lancet. 2019;393(10170):447-492. doi:10.1016/S0140-6736(18)31788-4
6. Bianchi F, Garnett E, Dorsel C, Aveyard P, Jebb SA. Restructuring physical micro-environments to reduce the demand for meat: a systematic review and qualitative comparative analysis. Lancet Planet Heal. 2018;2(9):e384-e397. doi:10.1016/S2542-5196(18)30188-8
7. World Cancer Research Fund/American Institute for Cancer Research. Recommendations and public health and policy implications. Continous Updat Proj. Published online 2018:1-90. https://www.wcrf.org/sites/default/files/Recommendations.pdf
8. The Culinary Institue Of America and President and Fellows of Harvard College. Principles of Healthy, Sustainable Menus: Guidance for Chefs, Foodservice Operators & their Customers. Published online 2013.
9. Stewart G, Patel R, Sucharitakul G. Report Summary: Can simple nudges reduce meat consumption? Unpublished. Published online 2016. http://www.environment.admin.cam.ac.uk/files/report_summary_-_georgia_stewart.pdf

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

LIGHT

The WELL Light concept promotes exposure to light and aims to create lighting environments that promote visual, mental and biological health.

Light is the main driver of the visual and circadian systems.[1] 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.[2] 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.[3–8] 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.[1,6,9,10] High lighting levels at night, including light from bright screens, can contribute to the disruption of the circadian rhythm.[3]

All light—not just sunlight—can contribute to circadian photoentrainment.[11] 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.[12] 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).[12] 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.[11,13]

Studies have shown that light exposure has an impact on the mood and reduces symptoms of depression in individuals.[14–16] Exposure to light has also been directly linked with health and can affect how we recover and heal. Rooms with large, sun-facing windows have been shown to reduce recovery time for patients suffering from severe depression and those recuperating after heart attacks, compared to similarly afflicted patients in rooms with windows facing buildings or other obstructions.[17] Reduced exposure to daylight has been linked to the onset of depression and impairment of cognitive function in individuals.[18,19] Studies show strong links between better views, brighter light and better performance in office environments.[20,21]

The lighting environments where humans spend their time impact their visual, circadian and mental health. Currently, lighting conditions in most spaces are designed to meet the visual needs of individuals but do not take into account circadian and mental health. This presents an opportunity for projects to provide lighting conditions required by humans for improved health and well-being.

Integrating daylight and electric light to create lighting strategies focused on human health, along with traditional requirements for visual acuity and comfort, can lead to healthier and more productive environments. Understanding the specific needs and preferences of users in a space is integral to creating effective lighting environments. For example, patients in a hospital ward have different lighting requirements than individuals in an office environment. Understanding user needs in a space is key to creating a healthier space. 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.[1,3]

The WELL Light concept aims to provide a lighting environment that reduces circadian phase disruption, improves sleep quality and positively impacts mood and productivity.

Note : Read more about the evidence behind the WELL Light Concept. Note: Material from the research digests is not covered on the WELL AP exam.

REFERENCES

1. Legates TA, Fernandez DC, Hattar S. Light as a central modulator of circadian rhythms, sleep and affect. Nat Rev Neurosci. 2014;15(7):443-454. doi:10.1038/nrn3743
2. 2Czeisler CA, Gooley JJ. Sleep and circadian rhythms in humans. Cold Spring Harb Symp Quant Biol. 2007;72:579-597. doi:10.1101/sqb.2007.72.064
3. Cho Y, Ryu S-H, Lee BR, Kim KH, Lee E, Choi J. Effects of artificial light at night on human health: A literature review of observational and experimental studies applied to exposure assessment. Chronobiol Int. 2015;32(9):1294-1310. doi:10.3109/07420528.2015.1073158

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

4. Challet E, Kalsbeek A. Circadian Rhythms and Metabolism. 2017. doi:10.3389/978-2-88945-282-8
5. Plano SA, Casiraghi LP, Moro PG, Paladino N, Golombek DA, Chiesa JJ. Circadian and metabolic effects of light: Implications in weight homeostasis and health. Front Neurol. 2017;8(OCT):558. doi:10.3389/fneur.2017.00558
6. Fonken LK, Nelson RJ. The effects of light at night on circadian clocks and metabolism. Endocr Rev. 2014;35(4):648-670. doi:10.1210/er.2013-1051
7. Boyce P, Barriball E. Circadian rhythms and depression. Aust Fam Physician. 2010;39(5):307-310. https://www.ncbi.nlm.nih.gov/pubmed/20485718.
8. Germain A, Kupfer DJ. Circadian rhythm disturbances in depression. Hum Psychopharmacol. 2008;23(7):571-585. doi:10.1002/hup.964
9. Hurley S, Goldberg D, Nelson D, et al. Light at night and breast cancer risk among california teachers. Epidemiology. 2014;25(5):697-706. doi:10.1097/EDE.0000000000000137
10. Li Q, Zheng T, Holford TR, Boyle P, Zhang Y, Dai M. Light at night and breast cancer risk: results from a population based case control study in Connecticut, USA. 2010;21(12):2281-2285. doi:10.1007/s10552-010-9653-z
11. Pickard GE, Sollars PJ. Intrinsically photosensitive retinal ganglion cells. Rev Physiol Biochem Pharmacol. 2012;162:59-90. doi:10.1007/112_2011_4
12. Skeldon AC, Phillips AJK, Dijk D-J. The effects of self-selected light-dark cycles and social constraints on human sleep and circadian timing: a modeling approach. Sci Rep. 2017;7(February):45158. doi:10.1038/srep45158
13. Buxton OM, L'Hermite-Balériaux M, Turek FW, van Cauter E. Daytime naps in darkness phase shift the human circadian rhythms of melatonin and thyrotropin secretion. Am J Physiol Integr Comp Physiol. 2000;278(2):R373-R382. doi:10.1152/ajpregu.2000.278.2.R373
14. Lam RW, Levitt AJ, Levitan RD, et al. Efficacy of bright light treatment, fluoxetine, and the combination in patients with nonseasonal major depressive disorder a randomized clinical trial. JAMA Psychiatry. 2016;73(1):56-63. doi:10.1001/jamapsychiatry.2015.2235
15. Figueiro MG. Disruption of Circadian Rhythms by Light During Day and Night. Curr Sleep Med Reports. 2017;3(2):76-84. doi:10.1007/s40675-017-0069-0
16. Swanson V et al. Indoor Annual Sunlight Opportunity in Domestic Dwellings May Predict Well-Being in Urban Residents in Scotland. Ecopsychology. 2016;8(2):121-130.
17. Joarder AR, Price ADF. Impact of daylight illumination on reducing patient length of stay in hospital after coronary artery bypass graft surgery. Light Res Technol. 2012;45(4):435-449. doi:10.1177/1477153512455940
18. Kent ST, McClure LA, Crosson WL, Arnett DK, Wadley VG, Sathiakumar N. Effect of sunlight exposure on cognitive function among depressed and non-depressed participants: A REGARDS cross-sectional study. Environ Heal A Glob Access Sci Source. 2009;8(1):34. doi:10.1186/1476-069X-8-34
19. Ruger M. Time-of-day-dependent effects of bright light exposure on human psychophysiology: comparison of daytime and nighttime exposure. AJP Regul Integr Comp Physiol. 2005;290(5):R1413-R1420. doi:10.1152/ajpregu.00121.2005
20. California Energy Commission. Windows and Offices: A Study of Work Performance and the Indoor Environment. 2003. doi:10.1175/1520-0450(1998)037<0414:TDFBIM>2.0.CO;2
21. Boubekri M, Cheung IN, Reid KJ, Wang CH, Zee PC. Impact of windows and daylight exposure on overall health and sleep quality of office workers: A case-control pilot study. J Clin Sleep Med. 2014;10(6):603-611. doi:10.5664/jcsm.3780

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

L01 LIGHT EXPOSURE | P

Intent : Provide indoor light exposure through daylight and electric light strategies.

Summary : This WELL feature requires projects to provide appropriate light exposure in indoor environments through lighting strategies.

Issue : Mammals function on an approximately 24-hour cycle, following what are referred to as circadian rhythms. [1] Light is the main driver of the circadian system, which controls body processes, such as digestion, the release of certain hormones, body temperature and sleep. Humans evolved their sleep schedules to be dependent on the natural day- night cycle. Electric light has only been widely used as a source of light for less than 200 years.[2] The increase in the use of electric lighting has led to indoor environments relying on electric light over daylight. However, reduced exposure to light has been linked to the onset of depression and impairment of cognitive function in individuals.[3,4] Irregular sleep-wake cycles have been linked to poorer academic performance in college students.[5] Studies have shown that light exposure during daytime has been linked to increases in productivity and sleep quality, as well as reduction in symptoms of depression in individuals.[6-8]

Solutions : Providing indoor access to adequate light can positively influence the productivity and mood of individuals, while supporting the alignment of their circadian rhythms with the natural day-night cycle.[9–12] Access to appropriate levels of light in indoor environments can be achieved through building design, façade design, space layout and lighting design. Windows, atriums and skylights are design features that can be utilized to increase daylight in a space. The interior layout of the space also has an impact on the daylight exposure received by users. For example, conference rooms can be added to the center of the floor plate, so that workstations can be situated near windows and have daylight exposure. Lighting strategies using electric lighting can be utilized to achieve required light exposure, when appropriate daylight exposure is not available.

PART 1 PROVIDE INDOOR LIGHT

For All Spaces except Dwelling Units & Guest Rooms:

Option 1: Daylight simulation

The project demonstrates, through computer simulations, that one of the following conditions are achieved:

a. The total floor area of regularly occupied spaces achieves one of the following targets:

Calculations per IES LM-83 [13]		Calculations per Annex A of CEN 17037
$sDA_{150,50\%}$ > 30%	OR	Target illuminance 19 fc is achieved for >30% of floor area throughout 50% of daylit hours of the year

b. Common space that has unassigned seating for at least 15% of regular occupants at any given time achieves one of the following targets:

Calculations per IES LM-83		Calculations per Annex A of CEN 17037
$sDA_{300,50\%}$ > 75%	OR	Target illuminance 28 fc is achieved for >30% of floor area and average illuminance 9 fc is achieved for >95% of floor area throughout 50% of daylit hours of the year

OR

Option 2: Interior layout

One of the following requirements is met:

a. At least 30% of the regularly occupied area is within a 20 ft horizontal distance of envelope glazing.

b. Common spaces have unassigned seating and can accommodate at least 15% of regular occupants at any given time. At least 70% of all seating in the spaces is within a 16 ft horizontal distance of envelope glazing.

OR

Option 3: Building design

One of the following requirements is met:

a. The envelope glazing area is no less than 7% of the regularly occupied floor area.

b.

The floor plate is no more than 65 ft between opposite walls that each have envelope glazing, and there are no opaque obstructions higher than 4 ft within a 20 ft horizontal distance of the envelope glazing.

OR

Option 4: Circadian lighting design

The following requirement is met:

a. The project meets the threshold of Tier 1 of Feature L03: Circadian Lighting Design.

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

For Dwelling Units & Guest Rooms:

Option 1: Daylight simulation

The project demonstrates, through computer simulations, that the following requirement is achieved:

a. The total floor area of regularly occupied spaces of each dwelling unit achieves one of the following targets:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Calculations per IES LM-83 [13]		Calculations per Annex A of CEN 17037
$sDA_{150,50\%}$ > 30%	OR	Target illuminance 19 fc is achieved for >30% of individual unit area throughout 50% of daylit hours of the year

OR

Option 2: Facade design

The following requirement is met:

a. The envelope glazing area is no less than 7% of the regularly occupied floor area for each dwelling unit.

OR

Option 3: Circadian lighting design

The following requirement is met:

a. The project achieves at least one point in Feature L03: Circadian Lighting Design.

REFERENCES

1. Czeisler CA, Gooley JJ. Sleep and circadian rhythms in humans. Cold Spring Harb Symp Quant Biol. 2007;72:579-597. doi:10.1101/sqb.2007.72.064
2. U.S. Department of Energy. The History of the Light Bulb. https://www.energy.gov/articles/history-light-bulb. Published 2013. Accessed April 1, 2018.
3. Kent ST, McClure LA, Crosson WL, Arnett DK, Wadley VG, Sathiakumar N. Effect of sunlight exposure on cognitive function among depressed and non-depressed participants: A REGARDS cross-sectional study. Environ Heal A Glob Access Sci Source. 2009;8(1):34. doi:10.1186/1476-069X-8-34
4. Ruger M. Time-of-day-dependent effects of bright light exposure on human psychophysiology: comparison of daytime and nighttime exposure. AJP Regul Integr Comp Physiol. 2005;290(5):R1413-R1420. doi:10.1152/ajpregu.00121.2005
5. Phillips AJK, Clerx WM, O'Brien CS, et al. Irregular sleep/wake patterns are associated with poorer academic performance and delayed circadian and sleep/wake timing. Sci Rep. 2017;7(1):3216. doi:10.1038/s41598-017-03171-4
6. Lam RW, Levitt AJ, Levitan RD, et al. Efficacy of bright light treatment, fluoxetine, and the combination in patients with nonseasonal major depressive disorder a randomized clinical trial. JAMA Psychiatry. 2016;73(1):56-63. doi:10.1001/jamapsychiatry.2015.2235
7. Figueiro MG, Steverson B, Heerwagen J, et al. The impact of daytime light exposures on sleep and mood in office workers. Sleep Heal. 2017;3(3):204-215. doi:10.1016/j.sleh.2017.03.005
8. Boubekri M, Cheung IN, Reid KJ, Wang CH, Zee PC. Impact of windows and daylight exposure on overall health and sleep quality of office workers: A case-control pilot study. J Clin Sleep Med. 2014;10(6):603-611. doi:10.5664/jcsm.3780
9. Phipps-Nelson J, Redman JR, Dijk DJ, Rajaratnam SMW. Daytime exposure to bright light, as compared to dim light, decreases sleepiness and improves psychomotor vigilance performance. Sleep. 2003;26(6):695-700. doi:10.1093/sleep/26.6.695
10. Legates TA, Fernandez DC, Hattar S. Light as a central modulator of circadian rhythms, sleep and affect. Nat Rev Neurosci. 2014;15(7):443-454. doi:10.1038/nrn3743
11. Edwards L, Torcellini P. A Literature Review of the Effects of Natural Light on Building Occupants A Literature Review of the Effects of Natural Light on Building Occupants. Contract. 2002;(July). doi:10.2172/15000841
12. Galasiu AD, Veitch JA. Occupant preferences and satisfaction with the luminous environment and control systems in daylit offices: a literature review. Energy Build. 2006;38(7):728-742. doi:10.1016/j.enbuild.2006.03.001
13. Illuminating Engineering Society. 2023. IES LM-83-23: Approved Method IES Spatial Daylight Autonomy (sDA) and Annual Sunlight Exposure (ASE). Reference

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

L02 VISUAL LIGHTING DESIGN | P

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

Summary : This WELL feature requires projects to provide appropriate illuminances 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.[1,2] 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 PROVIDE VISUAL ACUITY

For All Spaces except Dwelling Units:

Option 1: Visual lighting design

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.[3]
   2. EN 12464-1:2021[4] or EN 12464-2:2014.[5]
   3. ISO 8995-1:2002(E) (CIE S 008/E:2001).[6]
   4. GB50034-2013.[7]
   5. CIBSE SLL Code for Lighting.[8]
b. The illuminance thresholds take into consideration the tasks and the age groups of the occupants.

OR

Option 2: Predetermined light levels

The following requirements are met:

a. More than 50% of the occupants are under the age of 65.
b. The area of outdoor space within the project boundary is less than 5% of the interior project area.
c. At least 90% of the interior project area is comprised of the following space types and meets the associated illuminance thresholds:

Room Types	Minimum Illuminance Threshold
Offices Classrooms	30 fc at task surface.[9]
Circulation areas (including lobbies and atria) Storage spaces	10 fc at floor level.[9]
Dining areas Lounges Restrooms	10 fc at task surface.[9]

For Dwelling Units:

Option 1: Promote Visual Acuity

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.[3]
   2. ISO 8995-1:2002(E) (CIE S 008/E:2001).[6]
   3. GB50034-2013.[7]
   4. CIBSE SLL Code for Lighting.[8]

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

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 :
Multifamily residential projects may achieve WELL Certification at the Bronze or Silver level without testing in dwelling units, but cannot achieve Gold or Platinum without testing in dwelling units. See Sampling Rates for Multifamily Residential in the WELL Performance Verification Guidebook for further details.

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

REFERENCES

1. Pokorny J, Smith VC, Lutze M. Aging of the human lens. Appl Opt. 1987;26(8):1437. doi:10.1364/AO.26.001437
2. Owsley C. Aging and vision. Vision Res. 2011;51(13):1610-1622. doi:10.1016/j.visres.2010.10.020
3. Illuminating Engineering Society. 2020. IES OL-IM-03: Lighting Applications Standards Collection Subscription. https://store.ies.org/product/lighting-applications-standards-collection-subscription/?v=7516fd43adaa
4. European Committee for Standardization. 2021. EN 12464-1:2021. Light and lighting - Lighting of work places - Part 1: Indoor work places. Accessed Febraury February 13, 2024. https://standards.iteh.ai/catalog/standards/sist/b1a68cbc-1bdc-4ac2-89e7-0123982763b5/sist-en-12464-2-2014
5. European Committee for Standardization. 2014. SIST EN 12464-2:2014 Light and lighting - Lighting of work places - Part 2: Outdoor work places. Accessed Febraury February 13, 2024. https://standards.iteh.ai/catalog/standards/sist/b1a68cbc-1bdc-4ac2-89e7-0123982763b5/sist-en-12464-2-2014
6. International Organization for Standardization. ISO 8995-1:2002 (CIE S 008/E:2001) - Lighting of work places -- Part 1: Indoor. 2001. https://www.iso.org/standard/28857.html.
7. Zheng W. GB 50034-2013 Standard for lighting design of buildings (English Version). https://books.google.com/books/about/GB_50034_2013_Translated_English_of_Chin.html?id=svamDgAAQBAJ. Published 2013. Accessed April 1, 2018.
8. The SLL Lighting Handbook The Society of Light and Lighting. CIBSE; 2018. www.cibse.org. Accessed June 9, 2020.
9. U.S. General Services Administration. P100 Facilities Standards for the Public Buildings Service.; 2018. https://www.gsa.gov/cdnstatic/2018 P100 Final 5-7-19_0.pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

L03 CIRCADIAN LIGHTING DESIGN | O (MAX : 3 PT)

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

Summary : This WELL 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.[1] Light deficiencies affects the functioning of the circadian system and quality of sleep. Disruption of circadian rhythm has been linked with obesity, diabetes, depression and metabolic disorders.[2–4] Exposure to light at night has also been associated with negative health effects, such as breast cancer, circadian phase disruption and sleep disorders.[5,6]

Solutions : Since 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.[7,8] 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.[5,9,10]

PART 1 MEET LIGHTING FOR DAY-ACTIVE PEOPLE (MAX : 3 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 above the work-plane for all workstations in regularly occupied spaces:

Tier	Threshold		Threshold for Projects with Enhanced Daylight	Points
1	At least 150 EML [136 melanopic EDI]	OR	At least 120 EML [109 melanopic EDI] and either L05 Part 1 or L06 Part 1	1
2	At least 275 EML [250 melanopic EDI][11]	OR	At least 180 EML [163 melanopic EDI] and either L05 Part 1 or L06 Part 1	3

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

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

For Dwelling Units & Guest Rooms:

The following requirements are met in each dwelling unit:

a.

Electric lighting is used to achieve the following light levels:

Tier	Threshold		Threshold for Projects with Enhanced Daylight	Points
1	At least 150 EML [136 melanopic EDI]	OR	At least 120 EML [109 melanopic EDI] and either L05 Part 1 or L06 Part 1	1
2	At least 275 EML [250 melanopic EDI][11]	OR	At least 180 EML [136 melanopic EDI] and either L05 Part 1 or L06 Part 1	3

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 55 in 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 18 in above the work-plane.

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

REFERENCES

1. Figueiro MG. Disruption of Circadian Rhythms by Light During Day and Night. Curr Sleep Med Reports. 2017;3(2):76-84. doi:10.1007/s40675-017-0069-0
2. Cho Y, Ryu S-H, Lee BR, Kim KH, Lee E, Choi J. Effects of artificial light at night on human health: A literature review of observational and experimental studies applied to exposure assessment. Chronobiol Int. 2015;32(9):1294-1310. doi:10.3109/07420528.2015.1073158
3. Li Q, Zheng T, Holford TR, Boyle P, Zhang Y, Dai M. Light at night and breast cancer risk: results from a population based case control study in Connecticut, USA. 2010;21(12):2281-2285. doi:10.1007/s10552-010-9653-z
4. Kim YJ, Lee E, Lee HS, Kim M, Park MS. High prevalence of breast cancer in light polluted areas in urban and rural

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

regions of South Korea: An ecologic study on the treatment prevalence of female cancers based on National Health Insurance data. Chronobiol Int. 2015;32(5):657-667. doi:10.3109/07420528.2015.1032413

5. Legates TA, Fernandez DC, Hattar S. Light as a central modulator of circadian rhythms, sleep and affect. Nat Rev Neurosci. 2014;15(7):443-454. doi:10.1038/nrn3743
6. Hurley S, Goldberg D, Nelson D, et al. Light at night and breast cancer risk among california teachers. Epidemiology. 2014;25(5):697-706. doi:10.1097/EDE.0000000000000137
7. Lockley SW, Arendt J, Skene DJ. Visual impairment and circadian rhythm disorders. Dialogues Clin Neurosci. 2007;9(3):301-314. doi:10.1080/10481881209348680
8. British Standards Institution. PD CEN/TR 16791:2017: Quantifying irradiance for eye-mediated non-image-forming effects of light in humans. 2017. https://shop.bsigroup.com/ProductDetail/?pid=000000000030310356.
9. Koo YS, Song JY, Joo EY, et al. Outdoor artificial light at night, obesity, and sleep health: Cross-sectional analysis in the KoGES study. Chronobiol Int. 2016;33(3):301-314. doi:10.3109/07420528.2016.1143480
10. Ostrin LA, Abbott KS, Queener HM. Attenuation of short wavelengths alters sleep and the ipRGC pupil response. Ophthalmic Physiol Opt. 2017;37(4):440-450. Reference
11. Brown, T.; Brainard, G.; Cajochen, C.; Czeisler, C.; Hanifin, J.; Lockley, S.; Lucas, R.; Munch, M.; O'Hagan, J.; Peirson, S.; Price, L.; Roenneberg, T.; Schlangen, L.; Skene, D.; Spitschan, M.; Vetter, C.; Zee, P.; Wright Jr., K. Recommendations for Healthy Daytime, Evening, and Night-Time Indoor Light Exposure. Preprints 2020, 2020120037 (doi: 10.20944/preprints202012.0037.v1)

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

L04 ELECTRIC LIGHT GLARE CONTROL | O (MAX : 2 PT)

Intent : Minimize glare caused by electric light.

Summary : This WELL feature requires projects to manage glare by using strategies, such as calculation of glare and choosing the appropriate light fixtures for the space.

Issue : Glare is defined as excessive brightness of the light-source, excessive brightness-contrasts and excessive quantity of light[1,2] and is an integral part of lighting design. Reducing glare improves the visual experience of the occupants in the space. Glare has been associated with a host of health issues that range from visual discomfort and eye fatigue to headaches and migraines.[1,3] Studies have also shown that glare can lead to visual impairment and discomfort, which can cause accidents in the workplace. Individuals under the age of 50 are more sensitive to glare.[4] Since a substantial section of the workforce falls into this age group, it is important to address glare to avoid visual fatigue and glare-induced headaches.

Solutions : Electric lighting, the light source, type of luminaires and lighting layout can help to reduce glare.

PART 1 MANAGE GLARE FROM ELECTRIC LIGHTING (MAX : 2 PT)

For All Spaces except Industrial:

Option 1: Luminaire considerations

All luminaires within regularly occupied spaces (excluding wall wash fixtures, concealed fixtures, emergency lighting and decorative fixtures installed as specified by the manufacturer) meet one of the following requirements when measured at light output representative of regular use conditions:

a. 100% of light is emitted above the horizontal plane.

b. Classified with Unified Glare Rating (UGR) of 19 or lower.

c. Luminance that does not exceed 6,000 cd/m^2 at any angle between 45 and 90 degrees from nadir.

OR

Option 2: Space considerations

All regularly occupied spaces meet the following requirement:

a. Classified with Unified Glare Rating (UGR) of 19 or lower.

For Industrial:

Option 1: Luminaire considerations

All luminaires within regularly occupied spaces (excluding wall wash fixtures, concealed fixtures, emergency lighting and decorative fixtures installed as specified by the manufacturer) meet one of the following requirements when measured at light output representative of regular use conditions:

a. 100% of light is emitted above the horizontal plane.

b. Classified with Unified Glare Rating (UGR) of 19 or lower.

c. Luminance that does not exceed 6,000 cd/m^2 at any angle between 45 and 90 degrees from nadir.

OR

Option 2: Space considerations

All regularly occupied spaces meet the following requirement:

a. Unified Glare Rating (UGR) of 19 or lower.

REFERENCES

1. Mainster MA, Turner PL. Glare's causes, consequences, and clinical challenges after a century of ophthalmic study. Am J Ophthalmol. 2012;153(4):587-593. doi:10.1016/j.ajo.2012.01.008
2. Abrahamsson M, Sjostrand J. Impairment of contrast sensitivity function (CSF) as a measure of disability glare. Investig Ophthalmol Vis Sci. 1986;27(7):1131-1136.
3. Harle DE, Shepherd AJ, Evans BJW. Visual stimuli are common triggers of migraine and are associated with pattern glare. Headache. 2006;46(9):1431-1440. doi:10.1111/j.1526-4610.2006.00585.x
4. Wolska A, Sawicki D. Evaluation of discomfort glare in the 50+ elderly: Experimental study. Int J Occup Med Environ Health. 2014;27(3):444-459. doi:10.2478/s13382-014-0257-9

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

L05 DAYLIGHT DESIGN STRATEGIES | O (MAX : 4 PT)

Intent : Provide daylight exposure indoors through design strategies.

Summary : This WELL feature requires projects to design spaces to integrate daylight into indoor environments, so that daylight may be used for visual tasks along with electric lighting. It also provides individuals with a connection to outdoor spaces through windows.

Issue : Humans spend approximately 90% of their time indoors.[1] The way buildings are designed has an enormous impact on occupant exposure to daylight.[2] Exposure to daylight has been proven to have a substantial impact on mood, circadian health and productivity.[2,3] Studies have associated lack of exposure to daylight with a disruption in the circadian rhythms of humans and a decrease in quality of sleep.[2] Rooms with large windows also reduce recovery time for patients suffering from severe depression and those recuperating after heart attacks, compared to similarly afflicted patients in rooms with windows facing buildings or other obstructions.[4–6] Window characteristics have also been found to have an impact on students' performance in schools.[7] Students have been shown to perform better, when they have access to windows that can be opened. [8] Studies also show strong links between quality of views in office environments and performance of employees.[9] Indoor spaces with daylight exposure have been shown to have fewer bacteria, compared to spaces without any light exposure.[10]

Solutions : Building design and interior layout have a substantial impact on the amount of daylight in an indoor space. Indoor daylight should be accounted for at all stages of building planning from architectural and façade design to interior design and layout. Indoor daylight planning should be coupled with glare control strategies, such as integrating shading for all windows.

PART 1 IMPLEMENT DAYLIGHT PLAN (MAX : 2 PT)

For All Spaces except Dwelling Units & Guest Rooms:

The following requirement is met:

a. The project demonstrates that the following conditions are achieved:

Tier	Interior Layout		Façade Design	Points
1	70% of all workstations are within 25 ft of envelope glazing. Visible light transmittance (VLT) is greater than 40%.	OR	Envelope glazing is no less than 15% of the regularly occupied floor area. Visible light transmittance (VLT) of windows is greater than 40%.	1
2	70% of all workstations are within 16 ft of envelope glazing. Visible light transmittance (VLT) is greater than 40%.	OR	Envelope glazing is no less than 25% of the regularly occupied floor area. Visible light transmittance (VLT) of windows is greater than 40%.	2

For Dwelling Units & Guest Rooms:

The following requirement is met:

a. One of the following requirements is met in each dwelling unit:

Tier	Vertical Envelope Glazing Requirements	Points
1	Vertical envelope glazing is no less than 15% of the regularly occupied floor area of each dwelling unit. Visible light transmittance (VLT) is greater than 40%	1
2	Vertical envelope glazing is no less than 25% of the regularly occupied floor area of each dwelling unit. Visible light transmittance (VLT) is greater than 40%	2

PART 2 INTEGRATE SOLAR SHADING (MAX : 2 PT)

For All Spaces except Dwelling Units & Guest Rooms:

The following requirements are met in regularly occupied spaces:

a. All vertical envelope glazing has shading that meets one of the following:

Tier	Type of Shading	Points
1	Manual shading controllable by regular occupants at all times. Shades are regularly opened once a day for all days that the project is in use	1
2	Shading is automated to prevent glare	2

For Dwelling Units & Guest Rooms:

The following requirements are met in dwelling units:

a. All vertical envelope glazing has shading that meets one of the following:

Tier	Type of Shading	Points

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

1	Manual shading is controllable by regular occupants at all times.	1
2	Shading is automated to prevent glare.	2

REFERENCES

1. Klepeis NE, Nelson WC, Ott WR, et al. The National Human Activity Pattern Survey (NHAPS): A resource for assessing exposure to environmental pollutants. J Expo Anal Environ Epidemiol. 2001;11(3):231-252. doi:10.1038/sj.jea.7500165
2. Boubekri M, Cheung IN, Reid KJ, Wang CH, Zee PC. Impact of windows and daylight exposure on overall health and sleep quality of office workers: A case-control pilot study. J Clin Sleep Med. 2014;10(6):603-611. doi:10.5664/jcsm.3780
3. Amundadottir ML, Rockcastle S, Khanie MS, Andersen M. A human-centric approach to assess daylight in buildings for non - visual health potential, visual interest and gaze behavior. Build Environ. 2016;113:1-40.
4. Beauchemin KM, Hays P. Dying in the dark: Sunshine, gender and outcomes in myocardial infarction. J R Soc Med. 1998;91(7):352-354. doi:10.1177/014107689809100703
5. Beauchemin KM, Hays P. Sunny hospital rooms expedite recovery from severe and refractory depressions. J Affect Disord. 1996;40(1-2):49-51. doi:10.1016/0165-0327(96)00040-7
6. Joarder AR, Price ADF. Impact of daylight illumination on reducing patient length of stay in hospital after coronary artery bypass graft surgery. Light Res Technol. 2012;45(4):435-449. doi:10.1177/1477153512455940
7. Heschong L, Wright RL, Okura S. Daylighting impacts on human performance in school. J Illum Eng Soc. 2002;31(2):101-114. doi:10.1080/00994480.2002.10748396
8. Heschong L. Daylighting in Schools: An Investigation into the Relationship between Daylighting and Human Performance. Detailed Report. Hmg-R-9803. 1999:140. http://eric.ed.gov/?id=ED444337.
9. California Energy Commission. Windows and Offices: A Study of Work Performance and the Indoor Environment. 2003. doi:10.1175/1520-0450(1998)037<0414:TDFBIM>2.0.CO;2
10. Fahimipour AK, Hartmann EM, Siemens A, et al. Daylight exposure modulates bacterial communities associated with household dust 06 Biological Sciences 0605 Microbiology. Microbiome. 2018;6(1). doi:10.1186/s40168-018-0559-4

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

L06 DAYLIGHT SIMULATION | O (MAX : 2 PT)

Intent : Ensure indoor daylight exposure through daylight simulation strategies.

Summary : This WELL feature requires projects to conduct daylight simulation calculations to make informed decisions around fenestration and shading, so as to provide appropriate daylight exposure for occupants.

Issue : The way buildings are designed has an enormous impact on occupant exposure to daylight.[1] Exposure to daylight has been proven to have a substantial impact on mood, circadian health and productivity.[1,2] Studies have associated lack of exposure to daylight with a disruption in the circadian rhythms of humans and a decrease in sleep quality. Students have been shown to perform better when they have access to windows that can be opened.[3] Indoor spaces with daylight exposure have been shown to have fewer bacteria, compared to spaces without any light exposure.[4]

Solutions : Building design and planning has a substantial impact on the amount of daylight in an indoor space. With the myriad of solutions available for daylight ingress and shading, indoor daylight exposure can be optimized by conducting simulations. Daylight simulations can inform choices for shading, support fenestration design, as well as the interior layout of a spaces.[5–7]

PART 1 CONDUCT DAYLIGHT SIMULATION (MAX : 2 PT)

For All Spaces except Dwelling Units & Guest Rooms:

The project demonstrates, through computer simulations, that the following conditions are achieved:

a.

The total floor area of regularly occupied spaces achieves one of the following targets:

Tier	Calculations per IES LM-83		Calculations per Annex A of CEN 17037	Points
1	$sDA_{300,50\%}$ > 55%	OR	Target illuminance of 28 fc is achieved for >50% of regularly occupied areas throughout 50% of daylit hours of the year	1
2	$sDA_{300,50\%}$ > 75%	OR	Target illuminance of 28 fc is achieved for >50% of total area and average illuminance 9 fc is achieved for >95% of total area throughout 50% of daylit hours of the year	2

For Dwelling Units & Guest Rooms:

The project demonstrates, through computer simulations, that the following conditions are achieved:

a. The total floor area of regularly occupied spaces of each dwelling unit achieves one of the following targets:

Tier	Calculations per IES LM-83		Calculations per Annex A of CEN 17037	Points
1	$sDA_{300,50\%}$ > 55%	OR	Target illuminance of 28 fc is achieved for >50% of individual unit area throughout 50% of daylit hours of the year	1
2	$sDA_{300,50\%}$ > 75%	OR	Target illuminance of 28 fc for >50% of individual unit area and average illuminance 9 fc is achieved for >95% of individual unit area throughout 50% of daylit hours of the year	2

REFERENCES

1. Boubekri M, Cheung IN, Reid KJ, Wang CH, Zee PC. Impact of windows and daylight exposure on overall health and sleep quality of office workers: A case-control pilot study. J Clin Sleep Med. 2014;10(6):603-611. doi:10.5664/jcsm.3780
2. Amundadottir ML, Rockcastle S, Khanie MS, Andersen M. A human-centric approach to assess daylight in buildings for non - visual health potential, visual interest and gaze behavior. Build Environ. 2016;113:1-40.
3. Heschong L. Daylighting in Schools: An Investigation into the Relationship between Daylighting and Human Performance. Detailed Report. Hmg-R-9803. 1999:140. http://eric.ed.gov/?id=ED444337.
4. Fahimipour AK, Hartmann EM, Siemens A, et al. Daylight exposure modulates bacterial communities associated with household dust 06 Biological Sciences 0605 Microbiology. Microbiome. 2018;6(1). doi:10.1186/s40168-018-0559-4
5. Sherif A, Sabry H, Wagdy A, Mashaly I, Arafa R. Shaping the slats of hospital patient room window blinds for daylighting and external view under desert clear skies. Sol Energy. 2016;133:1-13. doi:10.1016/j.solener.2016.03.053
6. Wagdy A, Sherif A, Sabry H, Arafa R, Mashaly I. Daylighting simulation for the configuration of external sun-

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

breakers on south oriented windows of hospital patient rooms under a clear desert sky. Sol Energy. 2017;149:164-175. doi:10.1016/j.solener.2017.04.009

7. Shen E, Hu J, Patel M. Energy and visual comfort analysis of lighting and daylight control strategies. Build Environ. 2014;78:155-170. doi:10.1016/j.buildenv.2014.04.028

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

L07 VISUAL BALANCE | O (MAX : 1 PT)

Intent : Create lighting environments that enhance visual comfort.

Summary : This WELL feature requires projects to develop and implement strategies to create a visually comfortable lighting environment.

Issue : A lighting environment may utilize different kinds of light sources, including daylighting and different types of electric lighting technology. Lighting is planned across spaces to achieve the required ambience and energy efficiency goals. However, fluctuating light levels impact the visual comfort of occupants and could lead to eye fatigue.[1] Sudden increases and decreases in brightness can cause a high level of visual discomfort.[2] Constant changes in lighting have been linked to distraction from the task at hand, which can decrease productivity and impact well-being.[3]

Solutions : Development of a lighting layout and operations schedule to complement the lighting design in a space is key to increasing the comfort of users. Evidence suggests that thoughtful planning of lighting in a space that takes into account color temperature, daylight and electric light supports a visually comfortable lighting environment.[4,5] Consideration of the ages of users, tasks performed and existing physical features in the space are also integral to creating a productive space.

PART 1 BALANCE VISUAL LIGHTING (MAX : 1 PT)

For All Spaces:

Option 1: Parameters for visual balance

Ambient lighting in all regularly occupied spaces meets at least three of the following requirements:

a. Horizontal and vertical luminance contrast ratios for an ambient light system is no more than 10:1 between adjacent independently controlled zones.

b. Illuminance uniformity ratio of at least 0.4 or 1:2.5 (minimum light level: average light level) is achieved on any horizontal task plane within a space.

c. One of the following:

1. A lighting automation system is in use and automatic changes in lighting characteristics, such as light levels, changes in color and distribution take place over a period of at least 10 minutes.

2. A lighting automation system is not in use.

d. The Correlated Color Temperature (CCT) in each room for similar fixtures is consistent (±200 K) at any point of time.

OR

Option 2: Design for visual balance

Lighting is designed by a lighting professional and takes into account the following considerations:

a. Luminance ratios on vertical and horizontal adjacent zones.

b. Illuminance uniformity on horizontal task planes.

c. Changes in lighting characteristics, such as light levels, changes in color and distribution.

d. Correlated Color temperature (CCT) of lights used.

REFERENCES

1. Kim SY, Kim JJ. The effect of fluctuating illuminance on visual sensation in a small office. Indoor Built Environ. 2007;16(4):331-343. doi:10.1177/1420326X06079947
2. Illuminating Engineering Society. Lighting Handbook. 10th ed. Illuminating Engineering Society; 2011. https://www.ies.org/store/lighting-handbooks/lighting-handbook-10th-edition/.
3. Veitch JA, Newsham GR, Boyce PR, Jones CC. Lighting appraisal, well-being and performance in open-plan offices: A linked mechanisms approach. Light Res Technol. 2008;40(2):133-148. doi:10.1177/1477153507086279
4. Linhart F, Scartezzini JL. Evening office lighting - visual comfort vs. energy efficiency vs. performance? Build Environ. 2011;46(5):981-989. doi:10.1016/j.buildenv.2010.10.002
5. Shen E, Hu J, Patel M. Energy and visual comfort analysis of lighting and daylight control strategies. Build Environ. 2014;78:155-170. doi:10.1016/j.buildenv.2014.04.028

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

L08 ELECTRIC LIGHT QUALITY | O (MAX : 3 PT)

Intent : Enhance visual comfort and minimize flicker for electric light.

Summary : This WELL feature requires projects to take into account characteristics of electric light used in the space, such as color rendering and flicker.

Issue : Humans have evolved to depend on the sun as the main and ideal source of light. Humans are tuned to the color rendering provided by daylight and recognize colors in association with daylight.[1] Color can impact peoples' cognition and behavior.[2] Using electric light with high color rendering can improve people's perception of a space, and low color rendering can impact the ability to differentiate between objects and perceive the surroundings accurately. Electric lighting used indoors also has low frequencies of flicker that are not present in daylight. Flicker has been associated with eye strain, headaches, migraines and epileptic seizures.[3–6] In 2016, migraines accounted for 16 million disability adjusted life years (DALYs) in men and 30 million DALYs inwomen.[7]

Solutions : Identifying and utilizing lighting fixtures that emit a high quality of light and do not display signs of flicker contributes to a comfortable and healthy space. Light fixtures with higher color rendering emit light that shows colors realistically. The CIE General Color Rendering Index ("CRI") and measures from IES TM-30 are commonly used to communicate the color rendering properties of a light source.

PART 1 ENHANCE COLOR RENDERING QUALITY (MAX : 1 PT)

For All Spaces except Circulation Areas:

All luminaires in occupiable spaces (except decorative fixtures, emergency lights and other lighting for signage) meet at least one of the following color rendering requirements. If tunable white lighting is used, the requirements are met at 1000 K intervals from the lower end (with a minimum of 2700 K) to the higher end (with a maximum of 5000 K):

a. CRI (R_a) ≥ 90.

b. CRI (R_a) ≥ 80 and R9 (R_9) ≥ 50.

c. IES TM-30 P1 (i.e., R_f ≥ 78, IES R_g ≥ 95, -1% ≤ IES $R_{cs,h1}$ ≤ 15%).[10]

For Circulation Areas:

All luminaires (except decorative fixtures, emergency lights and other special-purpose lighting) meet at least one of the following color rendering requirements:

a. CRI (R_a) ≥ 80.

b. P2 (i.e., IES R_f ≥ 75, IES R_g ≥ 92, -7% ≤ IES $R_{cs,h1}$ ≤ 19%).

PART 2 MANAGE FLICKER (MAX : 2 PT)

For All Spaces:

All luminaires (except decorative lights, emergency lights and other lighting for signage) and their controls within occupiable spaces meet at least one of the following requirements:

a. Classified as "reduced flicker operation" per California Title 24, when tested according to the requirements in Joint Appendix JA-10.[8]

b. Recommended practices 1, 2 or 3 as defined by IEEE standard 1789-2015 LED.[9]

c. Pst LM ≤ 1.0 and SVM ≤ 0.6.

REFERENCES

1. Papamichael K, Siminovitch M, Veitch JA, Whitehead L. High Color Rendering Can Enable Better Vision without Requiring More Power. LEUKOS - J Illum Eng Soc North Am. 2016;12(1-2):27-38. doi:10.1080/15502724.2015.1004412
2. Elliot AJ, Maier M. Color Psychology: Effects of Perceiving Color on Psychological Functioning in Humans. Ssrn. 2014;65(1):95-120. doi:10.1146/annurev-psych-010213-115035
3. Canadian Centre for Occupational Health and Safety. Lighting Ergonomics-Light Flicker. https://www.ccohs.ca/oshanswers/ergonomics/lighting_flicker.html. Published 2015. Accessed April 4, 2018.
4. Veitch JA. Modulation of Fluorescent light: flicker rate and light source effects on visual performance and visual comfort. http://web.mit.edu/parmstr/Public/NRCan/nrcc38944.pdf.
5. Harding G, Wilkins AJ, Erba G, Barkley GL, Fisher RS. Photic- and pattern-induced seizures: expert consensus of the Epilepsy Foundation of America Working Group. Epilepsia. 2005;46(9):1423-1425. doi:10.1111/j.1528-1167.2005.31305.x
6. Wilkings AJ, Nimmo-Smith I, Slater AI, Bedocs L. Fluorescent lighting, headaches and eyestrain. Light Res Technol. 1989;21(1):11-18.
7. Institute for Health Metrics and Evaluation. GBD Compare. 2017. https://vizhub.healthdata.org/gbd-compare/.
8. 2016 Building Energy Efficiency Standards. JA10.1 Introduction. California Energy Commision. https://energycodeace.com/site/custom/public/reference-ace-2016/index.html#!Documents/ja101introduction1.htm. Published 2016. Accessed February 18, 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

9. IEEE Standards Association. IEEE Std 1789-2015 - IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers. 2016. doi:10.1109/IEEESTD.2015.71186
10. Illuminating Engineering Society. 2024. IES TM-30-24: IES Method for Evaluating Light Source Color Rendition. Reference

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

L09 OCCUPANT LIGHTING CONTROL | O (MAX : 3 PT)

Intent : Provide individuals with customizable lighting environments.

Summary : This WELL feature requires projects to implement innovative lighting strategies that take into account personal preferences of users, as well as their interaction with the physical space.

Issue : Humans spend about 90% of their time indoors and the ambience of the indoor environments has an impact on the well-being and productivity of occupants. Lighting in a space has been shown to have a positive impact on mood and cognitive performance.[1,2] Lighting environments that are customizable by individuals have been shown to improve satisfaction levels.[3] The ages of occupants have an impact on the light levels required for visual acuity. [4,5] Lighting guidelines recommend twice the light levels for individuals over the age of 65 years, compared to individuals between the ages of 25 years and 65 years.[5,6] As humans age, the transmission of light through their lens 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.[7,8]

Solutions : Developing a lighting environment that not only seeks to satisfy the visual and circadian requirements of individuals, but also creates a customizable environment helps to improve productivity, mood and well-being. Innovative lighting strategies, including the customization of a user's immediate environment, can contribute to occupant satisfaction with the space. Creating zones with lighting conditions that are distinct from the lighting in regular workspaces, can create a comfortable and informal environment that individuals can utilize for social interaction. Lighting environments can help to improve mental health, reduce stress and improve visual acuity.[1,9]

PART 1 ENHANCE OCCUPANT CONTROLLABILITY (MAX : 2 PT)

For All Spaces:

1: Lighting zones

Ambient lighting systems meet the following requirement:

a.

All regularly occupied spaces contain lighting zones as shown in the table below (note: individual rooms smaller than the areas below and/or that have occupancies less than those listed in the table are considered separate zones):

Tier	Number of Zones		Number of Zones	Points
1	One per 650 ft^2	OR	One per 10 occupants	1
2	One per 320 ft^2	OR	One per 5 occupants	2

2: Lighting control system

Each lighting zone meets the following requirements:

a. Lighting systems have at least three lighting levels or scenes that allow for changes in light levels.

b. Lighting systems have the ability to change at least one of the following:

   1. Color.
   2. Correlated color temperature (CCT).
   3. Distribution of light by controlling different groups of lights or through preset scenes.

c. All regular occupants have control over their immediate lighting environment through at least one of the following:

   1. Manual controls (e.g. switches or control panels) located in the same space as each lighting zone.
   2. Digital interface available on a computer or phone.

d. Lighting for presentation or projection walls are separately controlled.

Note :

Projects may identify spaces within the project boundary where lighting controls are limited to certain regular occupants (e.g., facilities staff, office manager) provided that these spaces do not make up more than 10% of the project size.

PART 2 PROVIDE SUPPLEMENTAL LIGHTING (MAX : 1 PT)

For All Spaces except Dwelling Units & Guest Rooms:

1: Supplemental lighting availability

The project meets the following requirements:

a. Supplemental light fixtures (e.g., task lights) are provided upon request to all employees at no cost and requests are fulfilled within eight weeks.

b. At least one supplemental light fixture is available for trial purposes.

2: Supplemental lighting requirements

Supplemental light fixtures meet the following requirements:

a. Light levels are controllable by occupants, independently from the ambient lighting system.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

b. The location of the light is adjustable by users of the workstation.

c. Under intended use, the light-emitting element is not visible to users.

REFERENCES

1. Küller R, Ballal S, Laike T, Mikellides B, Tonello G. The impact of light and colour on psychological mood: A cross-cultural study of indoor work environments. Ergonomics. 2006;49(14):1496-1507. doi:10.1080/00140130600858142
2. Knez I, Kers C. Effects of indoor lighting, gender, and age on mood and cognitive performance. Environ Behav. 2000;32(6):817-831. doi:10.1177/0013916500326005
3. Veitch JA, Newsham GR. Exercised control, lighting choices, and energy use: An office simulation experiment. J Environ Psychol. 2000;20(3):219-237. doi:10.1006/jevp.1999.0169
4. Illuminating Engineering Society. Recommended Practice for Lighting and the Visual Environment for Seniors and the Low Vision Population. Illuminating Engineering Society https://www.ies.org/store/recommended-practices-and-ansi-standards/lighting-and-the-visual-environment-for-seniors-and-the-low-vision-population/.
5. Illuminating Engineering Society. Lighting Handbook. 10th ed. Illuminating Engineering Society; 2011. https://www.ies.org/store/lighting-handbooks/lighting-handbook-10th-edition/.
6. Illuminating Engineering Society. Recommended practice for office lighting. 2013. https://www.ies.org/store/recommended-practices-and-ansi-standards/american-national-standard-practice-for-office-lighting/.
7. Pokorny J, Smith VC, Lutze M. Aging of the human lens. Appl Opt. 1987;26(8):1437. doi:10.1364/AO.26.001437
8. Owsley C. Aging and vision. Vision Res. 2011;51(13):1610-1622. doi:10.1016/j.visres.2010.10.020
9. Gifford R. Light, decor, arousal, comfort and communication. J Environ Psychol. 1988;8(3):177-189. doi:10.1016/S0272-4944(88)80008-2

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

APPENDIX L1:

The impact of light on the circadian system can be measured using a metric called Equivalent Melanopic Lux. This metric was proposed by Lucas and others (Lucas et al., "Measuring and using light in the melanopsin age." Trends in Neuroscience, Jan 2014). The authors provided a toolbox which for a desired spectrum derives equivalent "α-opic" lux for each of the five photoreceptors in the eye (three cones, rods, and the ipRGCs).

EML is dependent on the light intensity as well as the spectral power density of light at the measurement point. Given a spectrum of light, each equivalent α-opic lux is related to each other by a constant called Melanopic Ratio (R).

To calculate the equivalent melanopic lux (EML), multiply the photopic lux (L) designed for or measured in a building by this constant (R): **EML = L × R**.

Projects may use spreadsheets published by the authors of the journal article or IWBI for this calculation.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

MOVEMENT

The WELL Movement concept promotes physical activity in everyday life through environmental design, policies and programs to ensure that movement opportunities are integrated into the fabric of our daily routines, buildings and communities.

Movement is intricately connected to all aspects of daily life. Physical activity includes various domains such as occupational, transportation, household and leisure-time activities. Our understanding of the relationship between physical activity and health continues to evolve. We now know that all movement matters for health and that physical activity can be accumulated through the day in a variety of ways.[1] Therefore, it is critical that our buildings, communities and surrounding environments support movement as a vital part of the human condition – and as a key health promotion tool.

Physical inactivity has been a primary focus within the public health community for decades, due to its contribution to pre-mature mortality and chronic diseases, including type II diabetes, cardiovascular disease, depression, stroke, dementia and some forms of cancer.[2–4] Despite the widely understood benefits of regular physical activity, global estimates from 2016 show that nearly a quarter (23%) of the adult population are physically inactive.[4] Rates of physical inactivity differ between developed and developing countries, where 29% and 15% of the population are estimated to be inactive, respectively.[4] Compared to adults, adolescents and older populations exhibit even higher levels of physical inactivity – about 80% and 53%, respectively.[4] In 2013, it is estimated that physical inactivity cost the healthcare systems globally about $54 billion and contributed to nearly $14 billion in productivity losses.[5] The reasons for these trends are complex and numerous. Shifts in economic conditions and daily living patterns at both global and national levels can impact health behaviors. For example, rising urbanization and economic development are associated with declining physical activity levels.[6]

Sedentary behavior is also rising. Sedentary behavior is distinct from physical inactivity and is characterized as very low-intensity, low-effort activities, such as sitting.[7] In a study published in 2011, self-reported time spent sitting ranged from 3-9 hours per day among adults, globally.[8] It is also has distinct biology, physiology and associated health outcomes. Sedentary behavior has been linked to poor health outcomes, including obesity, type II diabetes, cardiovascular risks and premature mortality.[9–13]

Our current work to combat physical inactivity and sedentary behaviors adopts a systems-thinking approach bringing together experts from varied disciplines: from ergonomists to exercise scientists, urban planners to architects, behavior change experts to workplace wellness champions, epidemiologists to policy experts and grass roots community organizers to Fortune 500 companies.

The WELL Movement concept aims to promote movement, foster physical activity and active living and discourage sedentary behavior, by creating and enhancing opportunities through the spaces where we spend our lives. The impact of changing the global physical activity narrative is substantial. Worldwide, if physical inactivity were reduced by 10%, more than half a million deaths could be averted, while over one million deaths could be averted, if physical inactivity was reduced by 25%. Furthermore, the elimination of physical inactivity has been predicted to increase the global lifespan by an average of 0.68 years.[14]

Note : Read more about the evidence behind the WELL Movement Concept. Note: Material from the research digests is not covered on the WELL AP exam.

REFERENCES

1. King AC, Powell KE, Physical Activity Guidelines Advisory Committee, Committee PAGA. 2018 Physical Activity Guidelines Advisory Committee Scientific Report. 2018. https://health.gov/paguidelines/second-edition/report.aspx.
2. Centers for Disease Control and Prevention. Facts about Physical Activity. https://www.cdc.gov/physicalactivity/data/facts.htm. Published 2014. Accessed December 6, 2017.
3. World Health Organization. Physical Activity. http://www.who.int/mediacentre/factsheets/fs385/en/. Published 2015. Accessed February 1, 2017.
4. Sallis JF, Bull F, Guthold R, et al. Progress in physical activity over the Olympic quadrennium. Lancet. 2017;388(10051):1325-1336. doi:10.1016/S0140-6736(16)30581-5
5. Ding D, Lawson KD, Kolbe-Alexander TL, et al. The economic burden of physical inactivity: A global analysis of major non-communicable diseases. Lancet. 2016;388(10051):1311-1324. doi:10.1016/S0140-6736(16)30383-X

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

6. Kohl 3rd HW, Craig CL, Lambert EV, et al. The pandemic of physical inactivity: global action for public health. Lancet. 2017;380(9838):294-305. doi:10.1016/S0140-6736(12)60898-8
7. Owen N, Healy GN, Matthews CE, Dunstan DW. Too Much Sitting: The Population-Health Science of Sedentary Behavior. Exerc Sport Sci Rev. 2010;38(3):105-113. doi:10.1097/JES.0b013e3181e373a2
8. Bauman A, Ainsworth BE, Sallis JF, et al. The descriptive epidemiology of sitting. A 20-country comparison using the International Physical Activity Questionnaire (IPAQ). Am J Prev Med. 2011;41(2):228-235. doi:10.1016/j.amepre.2011.05.003
9. Owen N, Salmon J, Koohsari MJ, Turrell G, Giles-Corti B. Sedentary behaviour and health: mapping environmental and social contexts to underpin chronic disease prevention. Br J Sports Med. 2014;48(3):174-177. doi:10.1136/bjsports-2013-093107
10. Young DR, Hivert M-F, Alhassan S, et al. Sedentary Behavior and Cardiovascular Morbidity and Mortality: A Science Advisory From the American Heart Association. Circulation. 2016;134(13):e262-79. doi:10.1161/CIR.0000000000000440
11. Chau JY, Grunseit AC, Chey T, et al. Daily Sitting Time and All-Cause Mortality: A Meta-Analysis. Gorlova OY, ed. PLoS One. 2013;8(11):e80000. doi:10.1371/journal.pone.0080000
12. Patterson R, McNamara E, Tainio M, et al. Sedentary behaviour and risk of all-cause, cardiovascular and cancer mortality, and incident type 2 diabetes: a systematic review and dose response meta-analysis. Eur J Epidemiol. 2018;1:1-19. doi:10.1007/s10654-018-0380-1
13. Biswas A, Oh PI, Faulkner GE, et al. Sedentary time and its association with risk for disease incidence, mortality, and hospitalization in adults a systematic review and meta-analysis. Ann Intern Med. 2015;162(2):123-132. doi:10.7326/M14-1651
14. Ozemek C, Lavie CJ, Rognmo Ø. Global physical activity levels - Need for intervention. Prog Cardiovasc Dis. 2019;62(2):102-107. doi:10.1016/j.pcad.2019.02.004

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

V01 ACTIVE BUILDINGS AND COMMUNITIES | P

Intent : Facilitate all types of movement, including physical activity and exercise and reduce sedentary behavior through the intentional design of built spaces.

Summary : This WELL feature requires projects to select from a series of design-based optimizations.

Issue : Physical inactivity is linked to premature mortality and chronic diseases, including type II diabetes, cardiovascular disease, depression, stroke, dementia and some forms of cancer.[1–3] Despite widely disseminated physical activity guidelines (Appendix V1), global estimates from 2016 show that nearly a quarter (23%) of the adult population are physically inactive.[3] In addition, our homes, schools, workplaces, communities, jobs and transportation systems have been physically designed to demand less movement and require more sedentary activities.[3,4]

Solutions : We have come to understand that our environments play a significant role in physical activity behaviors. [2,5–10] Active design considers how different components of a building, such as staircases can encourage movement.[11] At a community scale, active design considers the ways in which communities can encourage populations to be active through public infrastructure, such as cycle lanes and green space. These factors, beyond physical activity promotion, also positively impact environmental, social and economic outcomes.[11,12] The impact of changing the global physical activity narrative is substantial. Worldwide, if physical inactivity were reduced by just 10%, more than half a million deaths could be averted, while over one million deaths could be averted, if physical inactivity were reduced by 25%.[13]

PART 1 DESIGN ACTIVE BUILDINGS AND COMMUNITIES

For All Spaces:

The project achieves at least one point in one of the following features:

a. Feature V03: Circulation Network.

b. Feature V04: Facilities for Active Occupants.

c. Feature V05: Site Planning and Selection.

d. Feature V08: Physical Activity Spaces and Equipment.

REFERENCES

1. Centers for Disease Control and Prevention. Facts about Physical Activity. https://www.cdc.gov/physicalactivity/data/facts.htm. Published 2014. Accessed December 6, 2017.
2. World Health Organization. Physical Activity. http://www.who.int/mediacentre/factsheets/fs385/en/. Published 2015. Accessed February 1, 2017.
3. Sallis JF, Bull F, Guthold R, et al. Progress in physical activity over the Olympic quadrennium. Lancet. 2017;388(10051):1325-1336. doi:10.1016/S0140-6736(16)30581-5
4. Owen N, Sparling PB, Healy GN, Dunstan DW, Matthews CE. Sedentary behavior: emerging evidence for a new health risk. Mayo Clin Proc. 2010;85(12):1138-1141. doi:10.4065/mcp.2010.0444
5. Durand CP, Andalib M, Dunton GF, Wolch J, Pentz MA. A systematic review of built environment factors related to physical activity and obesity risk: Implications for smart growth urban planning. Obes Rev. 2011;12(5):e173-82. doi:10.1111/j.1467-789X.2010.00826.x
6. McCormack GR, Shiell A. In search of causality: A systematic review of the relationship between the built environment and physical activity among adults. Int J Behav Nutr Phys Act. 2011;8(1):125. doi:10.1186/1479-5868-8-125
7. Transportation Research Board. Does the Built Environment Influence Physical Activity? Examining the Evidence - Special Report 282. Washington, DC; 2005. http://www.nap.edu/catalog/11203/does-the-built-environment-influence-physical-activity-examining-the-evidence.
8. Renalds A, Smith TH, Hale PJ. A systematic review of built environment and health. Fam Community Heal. 2010;33(1):68-78. doi:10.1097/FCH.0b013e3181c4e2e5
9. Urban Land Institute. Intersections: Health and the Built Environment. Washington, DC: Urban Land Institute; 2013. http://uli.org/wp-content/uploads/ULI-Documents/Intersections-Health-and-the-Built-Environment.pdf.
10. King AC, Powell KE, Physical Activity Guidelines Advisory Committee, Committee PAGA. 2018 Physical Activity Guidelines Advisory Committee Scientific Report. 2018. https://health.gov/paguidelines/second-edition/report.aspx.
11. City of New York. Active Design Guidelines: Promoting Physical Activity and Health in Design. New York, NY; 2010. http://www1.nyc.gov/assets/planning/download/pdf/plans-studies/active-design-guidelines/adguidelines.pdf.
12. Sallis JF, Spoon C, Cavill N, et al. Co-benefits of designing communities for active living: An exploration of literature. Int J Behav Nutr Phys Act. 2015. doi:10.1186/s12966-015-0188-2
13. Lee IM, Shiroma EJ, Lobelo F, et al. Effect of physical inactivity on major non-communicable diseases worldwide:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

An analysis of burden of disease and life expectancy. Lancet. 2012;380(9838):219-229. doi:10.1016/S0140-6736(12)61031-9

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

V02 ERGONOMIC WORKSTATION DESIGN | P

Intent : Reduce the risk of physical strain on the body through ergonomic design at workstations that supports neutral body positions for seated and standing work and provides opportunities to alternate between seated and standing positions.

Summary : This WELL feature requires projects to provide ergonomic workstation furnishings that support all users, allow for customized workstation fit, and allow user orientation on ergonomic design and adjustability features.

Issue : In 2016, musculoskeletal disorders (MSDs) ranked among the top drivers of global disability.[1,2] MSDs are one of the most commonly reported causes of lost or restricted work time and also contribute to absenteeism and low productivity.[3,4] Risk factors in the workplace vary by the type of tasks being performed. In manual labor work environments, risk factors include heavy lifting, bending, reaching overhead and pushing or pulling heavy objects.[4] In office settings, risk factors are no less prevalent and include workstation design that forces the body into awkward positions along with other occupational factors that expose the body to prolonged or repetitive tasks.[5]

Solutions : An ideal ergonomic work environment is conducive to the necessary breadth of tasks assigned to that space, while encouraging movement through a variety of positions throughout the day. Effective ergonomic interventions that support all users include both design (e.g., adjustable furniture) and programmatic (e.g., education) approaches.[6,7] Ergonomic design solutions facilitate customizability at workstations allowing users to better fit workstations to their needs. Preliminary studies have demonstrated an ROI for ergonomics interventions. One study found a return of $10 USD for every $1 USD invested.[8] A different study examining outcomes across 250 case studies found generally positive results, including a reduction in the number (49.5% across 37 studies) and cost (64.8% across 22 studies) of work-related MSDs, and also noted that the payback period was generally less than one year.[9]

PART 1 SUPPORT VISUAL ERGONOMICS

For Office Spaces:

The project meets the following requirements:

a. Workstations where desktop computers are used provide support for user adjustability (monitor height, viewing angle, horizontal distance) through one of the following:
   1. Monitors with built-in height and angle adjustment.[10,11]
   2. Monitor stands or arms that allow height, angle and horizontal adjustment.[10,11]

b. Workstations where laptops are primarily used provide support for user adjustability through at least one of the following:
   1. An external keyboard, mouse and laptop stand such that the laptop screen can be positioned by the user (screen height, viewing angle, horizontal distance).[11]
   2. An external monitor that meets requirement a.[11]

PART 2 PROVIDE HEIGHT-ADJUSTABLE WORK SURFACES

For Office Spaces:

At least 25% of all workstations can be adjusted by the user for both seated and standing work, through one of the following:

a. Manual or electric height-adjustable work surfaces that provide users with the ability to customize workstation height at both seated and standing positions.[10,11]

b. Supplemental solutions (e.g., stand) that allow all or part of the work surface, monitor and primary input devices (e.g., keyboard, mouse) to be raised or lowered to seated or standing heights.[10,11]

PART 3 PROVIDE CHAIR ADJUSTABILITY

For Office Spaces:

All seating at workstations meets the following requirements:

a. The seat height is adjustable.[10,11]

b. One of the following:[10]

   i. The seat pan depth is adjustable.

   ii. The seat pan depth is 16.9 in or less.

c. One of the following:[10,11]

   i. The backrest lumbar support is height adjustable.

   ii. The backrest angle is adjustable.

   iii. The armrest height and distance between armrests are adjustable.

PART 4 PROVIDE SUPPORT AT STANDING WORKSTATIONS

For All Spaces except Commercial Kitchen Spaces:

Option 1: Support for standing workers

All workstations in which users are regularly required to stand for 50% or more of their working hours (e.g., assembly line station, hotel check-in counter, supermarket check-out counter) incorporate at least two of the following:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

a. Anti-fatigue mats, impact reducing flooring or a similar strategy.[12]

b. Recessed toe space of at least 4 in depth and height.13

c. A footrest or footrail.[12,14]

d. A sit-stand stool or high stool.[12,14]

OR

Option 2: No standing workers

The project meets the following requirement:

a. There are no workstations at which users are regularly required to stand for 50% or more of their working hours.

PART 5 PROVIDE WORKSTATION ORIENTATION

For All Spaces:

The following requirement is met:

a. All eligible employees receive an orientation (e.g., in-person or virtual training, self-guided digital training) to workstations in the space covering, at minimum, the following:

   1. Adjustability features of all available workstation types (as applicable) and their benefits to users (e.g., customized fit for individual comfort).
   2. Instructions on how to make adjustments to achieve the intended benefits (e.g., customized fit for individual comfort).
   3. Orientation resources that can be used for future reference.

REFERENCES

1. Institute for Health Metrics and Evaluation (IHME). GBD Compare. 2015. http://vizhub.healthdata.org/gbd-compare.
2. Agarwal S, Steinmaus C, Harris-Adamson C. Sit-stand workstations and impact on low back discomfort: a systematic review and meta-analysis. Ergonomics. 2018. doi:10.1080/00140139.2017.1402960
3. Bevan S. Economic impact of musculoskeletal disorders (MSDs) on work in Europe. Best Pract Res Clin Rheumatol. 2015;29(3):356-373. doi:10.1016/j.berh.2015.08.002
4. Occupational Safety and Health Administration. Ergonomics - Overview. https://www.osha.gov/SLTC/ergonomics/. Accessed October 31, 2017.
5. Hedge A. Ergonomic Workplace Design for Health, Wellness, and Productivity. In: Ergonomic Workplace Design for Health, Wellness, and Productivity. ; 2016:1-443. doi:10.1201/9781315374000
6. American National Standards Institute (ANSI), Canadian Standards Association. CSA Z412-2017: Office Ergonomics An Application Standard For Workplace Ergonomics. Presented at the: 2017. https://webstore.ansi.org/Standards/CSA/CSAZ4122017?gclid=CjwKCAjw_qb3BRAVEiwAvwq6Vr6zDZ6zG1pch-2J-MkwBlZnFR5bVyD9Rfd9vQIg51GY8Ua47l1U4BoCFeIQAvD_BwE.
7. U.S. General Accounting Office. Worker Protection: Private Sector Ergonomics Programs Yield Positive Results. Washington, DC; 1997. http://www.gao.gov/assets/230/224570.pdf.
8. Heller-ono A. A Prospective Study of a Macroergonomics Process over Five Years Demonstrates Significant Prevention of Workers' Compensation Claims Resulting in Projected Savings. 2009:1-4. http://worksiteinternational.com/pdf/ODAM-NES-2014-ARH-paper-Final-Submission.pdf.
9. Goggins RW, Spielholz P, Nothstein GL. Estimating the effectiveness of ergonomics interventions through case studies: Implications for predictive cost-benefit analysis. J Safety Res. 2008;39(3):339-344. doi:10.1016/J.JSR.2007.12.006
10. Human Factors and Ergonomics Society. ANSI/HFES 100-2007 - Human Factors Engineering of Computer Workstations. Human Factors and Ergonomics Society; 2007. https://www.hfes.org/Order/PublicationDetailsByProductId?ProductId=69.
11. Business and Institutional Furniture Manufacturers Association. ANSI/BIFMA X10.1-2024 - Ergonomics Requirements for Furniture Designed for Computer Use; 2024. https://www.madcad.com/store/subscription/BIFMA-X10.1-2024/.
12. Ebben JM. Improved Ergonomics for Standing Work. Occup Saf Heal. 2003;72(4):72-76.
13. U.S. Occupational Safety and Health Administration. Guidelines for Retail Grocery Stores: Ergonomics for the Prevention of Musculoskeletal Disorders. 2004.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

https://www.osha.gov/ergonomics/guidelines/retailgrocery/retailgrocery.html#front.

14. Canadian Centre for Occupational Health and Safety. Working in a Standing Position - Basic Information. https://www.ccohs.ca/oshanswers/ergonomics/standing/standing_basic.html. Accessed May 15, 2018.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

V03 CIRCULATION NETWORK | O (MAX : 3 PT)

Intent : Encourage stair use through aesthetic design, signage and visibility of staircases.

Summary : This WELL feature requires projects to design staircases for everyday use and leverage aesthetics, visibility/positioning, and prompts to encourage stair use.

Issue : Physical inactivity and sedentariness have emerged as a primary focus of public health in recent years, due to the host of negative health implications associated with both behaviors.[1–6] Strategies that promote stair use and general movement throughout buildings have emerged as promising interventions that encourage short bouts of health-enhancing physical activity throughout the day.[7,8]

Solutions : Evidence from systematic reviews (including international data from a variety of settings, such as airports, healthcare facilities, universities and offices) suggests that stairwell enhancements and signage increase stair use.[9–12] In particular, point-of-decision design prompts that include directional signage and motivational messaging have been shown to be effective at increasing stair use.[9–14] Evidence suggests that improving aesthetic and atmosphere with design, music and artwork, as well as tailoring motivational signage and prompts to the audience or population the space serves, may help increase intervention effectiveness.[9,15,16] Novel strategies, such as gamification, which leverages game elements to encourage desired behaviors, have been introduced as fun and innovative ways to encourage healthy behaviors, such as stairclimbing in both public and private settings.[17] At the design level, thoughtful stair placement, especially in new construction, can significantly enhance movement opportunities throughout the day. Evidence-based guidelines, such as the Active Design Guidelines suggest that stairs should be proximate to main entry points and located physically and visibly before elevator or escalator banks.[7]

PART 1 DESIGN AESTHETIC STAIRCASES (MAX : 1 PT)

For All Spaces:

At least one staircase is open to regular occupants, services all occupiable floors of the project and is aesthetically designed through the inclusion of at least two independent strategies from the following list on each floor:

a. Music.[7]
b. Artwork.[7]
c. Designed to have light levels of at least 100 lux when in use.[19]
d. Windows or skylights that provide access to daylight and/or nature views.[7,18]
e. Natural design elements (e.g., plants, water features, images of nature).[7]
f. Gamification.[17]

Note : Interiors projects may earn this feature either through stairs within the project boundary or through base building stairs outside of the project boundary. Stairs must service all floors of the project but do not need to be accessible from the ground floor of the building.

PART 2 INTEGRATE POINT-OF-DECISION SIGNAGE (MAX : 1 PT)

For All Spaces:

At least one staircase is open to regular occupants, services all occupiable floors of the project and is supported by the following:

a. Motivational, point-of-decision signage is present at the following locations:
    1. Near the main building entrance or the reception desk.[7]
    2. At elevator or escalator banks on each floor.[7]
    3. At the base of stairs and stairwell re-entry points on each floor.[7]
b. If stairs are not visible from signage locations, wayfinding signage is used to guide occupants to the stairs.[7]

Note : Interiors projects may earn this feature either through stairs within the project boundary or through base building stairs outside of the project boundary. Stairs must service all floors of the project but do not need to be accessible from the ground floor of the building. If the project does not access the stairs from the ground floor, they are exempt from requirement a1, which requires signage on the ground floor.

PART 3 PROMOTE VISIBLE STAIRS (MAX : 1 PT)

For All Spaces:

At least one staircase is open to regular occupants, services all occupiable floors of the project and meets the following requirement:

a. Is at least as prominent (visual or physical) as elevators/escalators relative to the main point of entry to the building or project space (e.g., entrance to the project on their floor).[7,18]

Note : Interiors projects may earn this feature either through stairs within the project boundary or through base building stairs outside of the project boundary. Stairs must service all floors of the project but do not need to be accessible from the ground floor of the building.

REFERENCES

1. Centers for Disease Control and Prevention. Facts about Physical Activity | Physical Activity | CDC. Centers for Disease Control and Prevention.
2. World Health Organization. Physical Activity. http://www.who.int/mediacentre/factsheets/fs385/en/. Published 2015. Accessed February 1, 2017.
3. Owen N, Salmon J, Koohsari MJ, Turrell G, Giles-Corti B. Sedentary behaviour and health: mapping environmental and social contexts to underpin chronic disease prevention. Br J Sports Med. 2014;48(3):174-177. doi:10.1136/bjsports-2013-093107

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

4. Young DR, Hivert M-F, Alhassan S, et al. Sedentary Behavior and Cardiovascular Morbidity and Mortality: A Science Advisory From the American Heart Association. Circulation. 2016;134(13):e262-79. doi:10.1161/CIR.0000000000000440
5. Chau JY, Grunseit AC, Chey T, et al. Daily Sitting Time and All-Cause Mortality: A Meta-Analysis. Gorlova OY, ed. PLoS One. 2013;8(11):e80000. doi:10.1371/journal.pone.0080000
6. Patterson R, McNamara E, Tainio M, et al. Sedentary behaviour and risk of all-cause, cardiovascular and cancer mortality, and incident type 2 diabetes: a systematic review and dose response meta-analysis. Eur J Epidemiol. 2018;1:1-19. doi:10.1007/s10654-018-0380-1
7. City of New York. Active Design Guidelines: Promoting Physical Activity and Health in Design. New York, NY; 2010. http://www1.nyc.gov/assets/planning/download/pdf/plans-studies/active-design-guidelines/adguidelines.pdf.
8. King AC, Powell KE, Physical Activity Guidelines Advisory Committee, Committee PAGA. 2018 Physical Activity Guidelines Advisory Committee Scientific Report. 2018. https://health.gov/paguidelines/second-edition/report.aspx.
9. Task Force on Community Preventive Services. Physical Activity: Point-of-Decision Prompts to Encourage Use of Stairs. The Community Guide. https://www.thecommunityguide.org/findings/physical-activity-point-decision-prompts-encourage-use-stairs. Published 2005. Accessed August 21, 2017.
10. Bellicha A, Kieusseian A, Fontvieille AM, Tataranni A, Charreire H, Oppert JM. Stair-use interventions in worksites and public settings - A systematic review of effectiveness and external validity. Prev Med (Baltim). 2015;70:3-13. doi:10.1016/j.ypmed.2014.11.001
11. Jennings CA, Yun L, Loitz CC, Lee E-Y, Mummery WK. A Systematic Review of Interventions to Increase Stair Use. Am J Prev Med. 2017;52(1):106-114. doi:https://doi.org/10.1016/j.amepre.2016.08.014
12. Soler RE, Leeks KD, Buchanan LR, Brownson RC, Heath GW, Hopkins DH. Point-of-Decision Prompts to Increase Stair Use. A Systematic Review Update. Am J Prev Med. 2010;38(2 SUPPL.). doi:10.1016/j.amepre.2009.10.028
13. Lee KK, Perry AS, Wolf SA, et al. Promoting Routine Stair Use: Evaluating the Impact of a Stair Prompt Across Buildings. Am J Prev Med. 2012;42(2):136-141. doi:https://doi.org/10.1016/j.amepre.2011.10.005
14. Eckhardt MR, Kerr J, Taylor WC. Point-of-decision signs and stair use in a university worksite setting: General versus specific messages. Am J Heal Promot. 2015;29(5):291-293. doi:10.4278/ajhp.120816-ARB-398
15. Bellicha A, Kieusseian A, Fontvieille AM, et al. A multistage controlled intervention to increase stair climbing at work: Effectiveness and process evaluation. Int J Behav Nutr Phys Act. 2016;13(1). doi:10.1186/s12966-016-0371-0
16. Kerr NA, Yore MM, Ham SA, Dietz WH. Increasing Stair Use in a Worksite Through Environmental Changes. Vol 18.; 2004.
17. Flynn N, Asquer A. Public Sector Management. 7th ed. SAGE; 2016. https://books.google.com/books?id=Rwd8DQAAQBAJ&dq=gamification+of+staircases&source=gbs_navlinks_s. Accessed March 8, 2018.
18. U.S. Green Building Council. LEED v4 BD+C: New Construction. Innovation: Design for Active Occupants.
19. Illuminating Engineering Society. 2020. IES OL-IM-03: Lighting Applications Standards Collection Subscription. Reference

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

V04 FACILITIES FOR ACTIVE OCCUPANTS | O (MAX : 3 PT)

Intent : Foster active commuting through facilities that support cycling to the building and active occupants more broadly.

Summary : This WELL feature requires projects to provide no-cost bike storage along with showers, changing facilities and lockers, which support both active commuters and active occupants.

Issue : Cycle commuting is associated with lower cardiovascular disease incidence and mortality, cancer incidence and all-cause mortality.[1] From 2000-2016, federal funding in the U.S. for pedestrian and cyclist infrastructure increased from 0.1% to 2.2% of transportation spending, which translated to an increase in those walking and biking to work.[2] However, research suggests that many communities still lack sufficient funding and infrastructure to support active commuting intentions.[2] For example, safety concerns, everyday transportation patterns, and a lack of bike parking and post-commute facilities often discourage cycling to work.[3–8]

Solutions : In a comprehensive review of the literature on this topic, studies reported that availability of amenities, such as bike parking and showers had a positive impact on cycling. [9] Projections from one study showed that compared to baseline (5.8%), outdoor parking would increase those cycling to work to 6.3%, indoor, secure parking to 6.6% and indoor parking plus showers to 7.1%.[10] In addition, lockers and changing/shower facilities, in particular, support activity goals and behaviors not only for cyclists but all occupants, such as those who might engage in physical activity or exercise before work. Such amenities signal to occupants that physical activity and, in particular, active commuting, is welcomed and encouraged. Thoughtful site planning and selection can also enhance opportunities for cycling. The presence of cyclist infrastructure, such as cyclist lanes and, in particular, infrastructure that promotes cyclist safety, is known to increase ridership.[11–13]

PART 1 PROVIDE CYCLING INFRASTRUCTURE (MAX : 2 PT)

For All Spaces except Dwelling Units & Retail Spaces:

1: Cycling network

One of the following requirements is met:

a. The project's address achieves a minimum Bike Score® of 50.[14] To utilize this tool, projects must be located in a country that is "supported" by the tool.

b. The building is within a 650 ft walk distance of an existing cycling network that connects riders to at least 10 use types that are within a 3 mi cycling distance of the project boundary.[15] Uses and restrictions are defined in Appendix V1.[16]

c. The project demonstrates existing plans for a cycling network that meets requirements a or b.

2: Bike parking

The following requirements are met:

a. Bike parking is provided to occupants at no cost in the following quantities:

   1. Short-term bike parking (e.g., public bike rack) is located within a 100 ft walk distance of a functional building entrance and can accommodate at least 2.5% of peak visitors (minimum of four spaces per building).[15]

   2. Long-term bike parking (e.g., bike room) is available within the project boundary and can accommodate at least 5% of regular occupants, excluding occupants under eight years old (minimum of four spaces per building).[15]

b. The project provides no cost access to basic bike maintenance tools (e.g., bike pump and patch kit) co-located with long-term bike parking or quarterly on-site bike maintenance services.

Note : Interiors projects may count base building amenities towards feature requirements.

For Retail Spaces:

1: Cycling network

One of the following requirements is met:

a. The project's address achieves a minimum Bike Score® of 50.[14] To utilize this tool, projects must be located in a country that is "supported" by the tool.

b. The building is within a 650 ft walk distance of an existing cycling network that connects riders to at least 10 use types that are within a 3 mi cycling distance of the project boundary.[15] Uses and restrictions are defined in Appendix V1.[16]

c. The project demonstrates existing plans for a cycling network that meets requirements a or b.

2: Bike parking

The following requirements are met:

a. Bike parking is provided to occupants at no cost in the following quantities:

   1. Short-term bike parking (e.g., public bike rack) is located within a 100 ft walk distance of a functional building entrance and includes at least two short-term bike storage spaces per 5000 ft2 of floor area (minimum of two

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

spaces per building).17

2. Long-term bike parking (e.g., bike room) is available within the project boundary and can accommodate at least 5% of regular occupants (minimum of two spaces per building).17

b. The project provides no cost access to basic bike maintenance tools (e.g., bike pump and patch kit) co-located with long-term bike parking or quarterly on-site bike maintenance services.

Note : Interiors projects may count base building amenities towards feature requirements.

For Dwelling Units:

1: Cycling network

One of the following requirements is met:

a. The project's address achieves a minimum Bike Score® of 50.[14] To utilize this tool, projects must be located in a country that is "supported" by the tool.

b. The building is within a 650 ft walk distance of an existing cycling network that connects riders to at least 10 use types that are within a 3 mi cycling distance of the project boundary.[15] Uses and restrictions are defined in Appendix V1.[16]

c. The project demonstrates existing plans for a cycling network that meets requirements a or b.

2: Bike parking

The following requirements are met:

a. Bike parking is provided to occupants at no cost in the following quantities:

1. Short-term bike parking (e.g., public bike rack) is located within a 100 ft walk distance of a functional building entrance and can accommodate at least 2.5% of peak visitors (minimum of four spaces per building).15

2. Long-term bike parking (e.g., bike room) is located within the project boundary and can accommodate at least 30% of regular occupants (minimum of one space per building).15

b. The project provides no cost access to basic bike maintenance tools (e.g., bike pump and patch kit) co-located with long-term bike parking or quarterly on-site bike maintenance services.

Note : Interiors projects may count base building amenities towards feature requirements.

PART 2 PROVIDE SHOWERS, LOCKERS AND CHANGING FACILITIES (MAX : 1 PT)

For All Spaces except Dwelling Units & Guest Rooms:

The following requirements are met:

a. Showers with changing facilities are available to occupants at no cost in a quantity listed below within a 650 ft walk distance of the project boundary:[15]

Regular Occupants (age 12 or older)	Required Number of Showers
0 - 100	One
101 - 999	One plus one for every 150 occupants above 100 Calculation: 1 + (# of occupants - 100) / 150
1,000 – 4,999	Eight plus one for every 500 occupants above 1,000 Calculation: 8 + (# of occupants - 1,000) / 500
5,000 + occupants	16 plus one for every 1,000 occupants above 5,000 Calculation: 16 + (# of occupants - 5,000) / 1,000

b. At least five lockers are available for every shower provided by the project. Lockers are co-located (i.e., in the same area/room, not on separate floors) with shower facilities.

Note : Interiors projects may count base building amenities towards feature requirements.

REFERENCES

1. Celis-Morales CA, Lyall DM, Welsh P, et al. Association between active commuting and incident cardiovascular disease, cancer, and mortality: Prospective cohort study. BMJ. 2017;357:j1456. doi:10.1136/BMJ.J1456

2. Cradock A, Barret J, Hull T, Fields B. Evidence to Inform a Cycling and Walking Investment Strategy.; 2019. https://cdn1.sph.harvard.edu/wp-content/uploads/sites/84/2019/05/Evidence-to-Inform-a-Cycling-and-

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Walking-Investment-Strategy_2019_04_30.pdf.

3. Buehler R. Determinants of bicycle commuting in the Washington, DC region: The role of bicycle parking, cyclist showers, and free car parking at work. Transp Res Part D Transp Environ. 2012;17(7):525-531. doi:10.1016/j.trd.2012.06.003
4. Wahlgren L, Schantz P. Exploring bikeability in a suburban metropolitan area using the Active Commuting Route Environment Scale (ACRES). Int J Env Res Public Heal. 2014;11(8):8276-8300. doi:10.3390/ijerph110808276
5. Transportation Alternatives. Indoor Bicycle Parking. https://www.transalt.org/issues/bike/network/parking/indoor.
6. Transportation Alternatives. Bicycle Parking Solutions: A Resource Guide for Improving Secure Bicycle Parking in New York City. https://www.transalt.org/sites/default/files/issues/bike/bikeparking.pdf.
7. Chapman R, Howden-Chapman P, Keall M, et al. Increasing active travel: Aims, methods and baseline measures of a quasi-experimental study. BMC Public Health. 2014;14(1). doi:10.1186/1471-2458-14-935
8. King AC, Powell KE, Physical Activity Guidelines Advisory Committee, Committee PAGA. 2018 Physical Activity Guidelines Advisory Committee Scientific Report. 2018. https://health.gov/paguidelines/second-edition/report.aspx.
9. Pucher J, Dill J, Handy S. Infrastructure, programs, and policies to increase bicycling: an international review. Prev Med. 2010;50 (suppl:S106-25. doi:10.1016/j.ypmed.2009.07.028
10. Wardman M, Tight M, Page M. Factors influencing the propensity to cycle to work. Transp Res Part A Policy Pract. 2007;41(4):339-350. doi:https://doi.org/10.1016/j.tra.2006.09.011
11. National Association of City Transportation Officials. Urban Bikeway Design Guide, 2nd ed. 2014:260. http://nacto.org/publication/urban-bikeway-design-guide/.
12. Reynolds CC, Harris MA, Teschke K, Cripton PA, Winters M. The impact of transportation infrastructure on bicycling injuries and crashes: a review of the literature. Environ Heal. 2009;8(1):47. doi:10.1186/1476-069X-8-47
13. Pucher J, Buehler R. Safer cycling through improved infrastructure. Am J Public Health. 2016;106(12):2089-2091. doi:10.2105/AJPH.2016.303507
14. Walk Score. Bike Score. https://www.walkscore.com/bike-score-methodology.shtml. Accessed January 1, 2018.
15. U.S. Green Building Council. LEED BD+C: New Construction - Bicycle Facilities. https://www.usgbc.org/credits/new-construction-data-centers-new-construction-hospitality-new-construction-warehouse-and--0?return=/credits/New%20Construction/v4.1https://www.usgbc.org/credits/new-construction-data-centers-new-construction-hospitality-new-construction-warehouse-and--0?return=/credits/New%20Construction/v4.1. Accessed January 1, 2020.
16. U.S. Green Building Council. LEED BD+C: Core and Shell - Surrounding density and diverse uses. https://www.usgbc.org/credits/core-shell/v2012/ltc4. Accessed January 1, 2018.
17. U.S. Green Building Council. LEED BD+C: Retail - Bicycle Facilities. https://www.usgbc.org/credits/retail-new-construction/v4-draft/ltc6. Accessed January 1, 2018.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

V05 SITE PLANNING AND SELECTION | O (MAX : 4 PT)

Intent : Promote movement, physical activity and active living through site and nearby amenities that facilitate walkability and offer convenient connections to public transportation.

Summary : This WELL feature requires projects to demonstrate that the area around the building is fostering walkability and that the building is located near public transportation.

Issue : Over time, nearly every aspect of our built environment has been designed to demand and invite less movement – giving preference to sedentary activities, such as driving. [1] In addition to interior active design, the context in which a WELL project is situated, including neighborhood and site-level factors, plays an integral role in physical activity opportunities and choices.[2–6]

Solutions : The impact of thoughtful site planning, design and selection reaches beyond positive impacts on physical activity and active living, improving nearly every aspect of community health and vitality from community connectedness to economic development.[7–9] There is no single metric or recipe that defines a walkable community. Features of walkable neighborhoods vary throughout the literature but centralize around several core design themes: proximity, connectivity, density, safety and aesthetics.[10] Walkable communities consider the needs of all users and abilities and are designed to facilitate mobility across the lifespan. Communities can be evaluated at different scales, down to the street and building scale. Single buildings can actually have important contributions to the streetscape. Buildings that activate the first level by incorporating aesthetic design can make positive contributions to the pedestrian environment.[11,12]

PART 1 SELECT SITES WITH PEDESTRIAN-FRIENDLY STREETS (MAX : 2 PT)

For All Spaces:

1: Pedestrian-friendly streets

At least one functional building entrance opens to a pedestrian network (i.e., streets where pedestrians travel featuring, at a minimum, sidewalks) and meets at least one of the following requirements:

a. The project's address achieves a minimum Walk Score® of 70. To utilize this tool, projects must be located in a country that is "supported" by the tool.

b. Opens onto a street with restricted vehicular traffic.[14]

c. Within a 0.25 mi distance of the project boundary, 90% of the total street length has continuous sidewalks on both sides and two of the following are met:

   1. At least eight existing use types (as defined in Appendix V1) are present.[15,16]
   2. Speed limits of 25 mph or less and street has buffer protections along sidewalks (e.g., curb extension, bioswales, bike lane, parked cars, benches, trees, planters).[17-19]
   3. Street segments intersect one another (excluding alleys) at least every 260-330 ft.[16,17]

2: Pedestrian-friendly environment

Exterior building walls facing the pedestrian network incorporate one or more of the following on the first floor or first 18 vertical feet (whichever is less):[17,20,21]

a. Windows or glazing that provide transparency into the space.

b. Overhangs such as canopies, awnings, eaves or shades.

c. Murals or other artistic installations.

d. Biophilic design elements (e.g., plants, water features, nature patterns, natural building materials).

e. Mixed building textures, colors and/or other design elements.

Note : Interiors projects may count base building amenities toward feature requirements.

PART 2 SELECT SITES WITH ACCESS TO MASS TRANSIT (MAX : 2 PT)

For All Spaces:

The project meets at least one of the following requirements:[22]

a. The project's address achieves a minimum Transit Score® of 70. To utilize this tool, projects must be located in country that is "supported" by the tool.

b. Is located within a 650 ft walk distance of existing bus network that provides at least 72 trips on each weekday and 30 trips on each weekend day.

c. Is located within a 0.25 mi walk distance of existing bus rapid transit stops, light or heavy rail stations, commuter rail stations or ferry services that provide at least 72 trips on each weekday and 30 trips on each weekend day.

REFERENCES

1. Owen N, Sparling PB, Healy GN, Dunstan DW, Matthews CE. Sedentary behavior: emerging evidence for a new health risk. Mayo Clin Proc. 2010;85(12):1138-1141. doi:10.4065/mcp.2010.0444
2. Durand CP, Andalib M, Dunton GF, Wolch J, Pentz MA. A systematic review of built environment factors related to physical activity and obesity risk: Implications for smart growth urban planning. Obes Rev. 2011;12(5):e173-82. doi:10.1111/j.1467-789X.2010.00826.x

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

3. McCormack GR, Shiell A. In search of causality: A systematic review of the relationship between the built environment and physical activity among adults. Int J Behav Nutr Phys Act. 2011;8(1):125. doi:10.1186/1479-5868-8-125
4. Transportation Research Board. Does the Built Environment Influence Physical Activity? Examining the Evidence - Special Report 282. Washington, DC; 2005. http://www.nap.edu/catalog/11203/does-the-built-environment-influence-physical-activity-examining-the-evidence.
5. Renalds A, Smith TH, Hale PJ. A systematic review of built environment and health. Fam Community Heal. 2010;33(1):68-78. doi:10.1097/FCH.0b013e3181c4e2e5
6. Urban Land Institute. Intersections: Health and the Built Environment. Washington, DC: Urban Land Institute; 2013. http://uli.org/wp-content/uploads/ULI-Documents/Intersections-Health-and-the-Built-Environment.pdf.
7. Task Force on Community Preventive Services. Physical Activity: Built Environment Approaches Combining Transportation System Interventions with Land Use and Environmental Design. The Community Guide. https://www.thecommunityguide.org/findings/physical-activity-built-environment-approaches. Published 2016. Accessed August 21, 2017.
8. Centers for Disease Control and Prevention. Physical Activity: Community Strategies. https://www.cdc.gov/physicalactivity/community-strategies/index.htm. Published 2015. Accessed December 1, 2015.
9. Mazumdar S et al. The built environment and social capital: A systematic review. Environ Behav. 2017;50(2):119-158. http://journals.sagepub.com/doi/abs/10.1177/0013916516687343.
10. U.S. Department of Health and Human Services, Services USD of H and H. STEP IT UP! The Surgeon General's Call to Action to Promote Walking and Walkable Communities. Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General; 2015. http://www.surgeongeneral.gov/library/calls/walking-and-walkable-communities/call-to-action-walking-and-walkable-communites.pdf.
11. Ewing R, Hajrasouliha A, Neckerman KM, Purciel-Hill M, Greene W. Streetscape Features Related to Pedestrian Activity. J Plan Educ Res. 2015;36(1):5-15. doi:10.1177/0739456x15591585
12. City of New York. Active Design: Shaping the Sidewalk Experience. 2013. https://www1.nyc.gov/assets/planning/download/pdf/plans-studies/active-design-sidewalk/active_design.pdf.
13. Walk Score. Walk Score Methodology. https://www.walkscore.com/methodology.shtml. Accessed January 1, 2018.
14. National Association of City Transportation Officials. Global Street Design Guide. Island Press; 2016. http://globaldesigningcities.org/publication/global-street-design-guide/.
15. U.S. Green Building Council. LEED BD+C: Core and Shell - Surrounding density and diverse uses. https://www.usgbc.org/credits/core-shell/v2012/ltc4. Accessed January 1, 2018.
16. City of New York. Active Design Guidelines: Promoting Physical Activity and Health in Design. New York, NY; 2010. http://www1.nyc.gov/assets/planning/download/pdf/plans-studies/active-design-guidelines/adguidelines.pdf.
17. Officials NA of CT, National Association of City Transportation Officials, Officials NA of CT. Global Street Design Guide. Island Press; 2016. http://globaldesigningcities.org/publication/global-street-design-guide/.
18. U.S. Green Building Council, Council USGB. LEED ND: Built Project - Walkable Streets. https://www.usgbc.org/node/2613997?return=/credits/neighborhood-development/v4/neighborhood-pattern-%26amp%3B-design. Accessed January 1, 2018.
19. City of New York, York C of N. Active Design: Shaping the Sidewalk Experience. 2013. http://www1.nyc.gov/assets/planning/download/pdf/plans-studies/active-design-sidewalk/active_design.pdf or http://www.drkarenlee.com/resources/sidewalks.
20. U.S. Green Building Council. LEED ND: Built Project - Walkable Streets. https://www.usgbc.org/node/2613997?return=/credits/neighborhood-development/v4/neighborhood-pattern-%26amp%3B-design. Accessed January 1, 2018.
21. Officials NA of CT. Urban Street Design Guide. 2013. http://nacto.org/publication/urban-street-design-guide/.
22. Walk Score. Walk Score Methodology, Last updated 7/15/2011.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

V06 PHYSICAL ACTIVITY OPPORTUNITIES | O (MAX : 2 PT)

Intent : Encourage physical activity and exercise through no-cost physical activity opportunities for occupants.

Summary : This WELL feature requires projects to provide no-cost physical activity opportunities led by a qualified physical activity professional.

Issue : Nearly a quarter of the global population fails to achieve physical activity guidelines and is considered physically inactive.[1] Key determinants of physical activity behavior include time, convenience, motivation, self-efficacy, weather conditions, travel and family obligations, fear of injury, lack of social support and environmental barriers such as availability of sidewalks, parks and bicycle lanes.[2,3] In a review conducted by the Centers for Disease Control and Prevention, two studies highlighted economic benefits of workplace programs, including reduced healthcare costs, decreased costs and days lost due to disability, reduced absenteeism and increased productivity.[4]

Solutions : The workplace is considered an effective platform to reach a broad segment of the adult population.[5] Therefore, workplace wellness programs and offerings are considered great steps toward decreasing barriers to physical activity engagement among employees.[6] The Community Preventive Services Task Force recommends worksite programs that make physical activity more readily available (e.g., providing health club memberships, changing insurance benefits, providing opportunities to be physically active) as a strategy to improve physical activity engagement.[7] Similar to the workplace, schools represent a ubiquitous platform to reach adolescents and youth.[5] The Community Preventive Services Task Force recommends classroom-based teaching strategies and physical education curricula that incorporate activity as promising strategies to increase physical activity among adolescents.[8] When considering physical activity education and programming, it's important to take into account the characteristics and preferences of the intended population. Events and education should be relevant to the community (i.e., ability and age-appropriate). Projects should also seek to solicit on-going feedback from their population and make an effort to consider feedback in revisions to programmatic offerings.

PART 1 OFFER PHYSICAL ACTIVITY OPPORTUNITIES (MAX : 2 PT)

For All Spaces:

No cost physical activity opportunities are available to regular occupants and meet the following requirements:

a. Programming is appropriate for the project population (e.g., age, ability, culture).

b. Programming is offered by a qualified physical activity professional either in-person within a 650 ft walk distance of the project boundary or virtually through live programming.

c. As applicable, physical activity opportunities are not withheld as a form of punishment for early childhood education, primary or secondary school students.[9]

d. Programming is offered at the following frequencies, as applicable:

Tier	Early Childhood Education, Primary and Secondary School Students (as applicable)	All other regular occupants	Points
1	At least one 60-minute event per week	At least one 30-minute event per week	1
2	> 60 minutes per school day[10]	> 150 minutes per week[10]	2

REFERENCES

1. Sallis JF, Bull F, Guthold R, et al. Progress in physical activity over the Olympic quadrennium. Lancet. 2017;388(10051):1325-1336. doi:10.1016/S0140-6736(16)30581-5
2. Humpel N, Owen N, Leslie E. Environmental factors associated with adults' participation in physical activity: A review. Am J Prev Med. 2002;22(3):188-199. doi:https://doi.org/10.1016/S0749-3797(01)00426-3
3. Centers for Disease Control and Prevention. Overcoming Barriers to Physical Activity. https://www.cdc.gov/physicalactivity/basics/adding-pa/barriers.html. Accessed March 7, 2018.
4. Task Force on Community Preventive Services. Physical Activity: Creating or Improving Places for Physical Activity. The Community Guide. https://www.thecommunityguide.org/findings/physical-activity-creating-or-improving-places-physical-activity. Published 2001.
5. 2018 Physical Activity Guidelines Advisory Committee. Part A: Executive Summary. All Hazards Risk Resil Prioritizing Crit Infrastruct Using RAMCAP Plus. 2010:1-3. doi:10.1115/1.802878.ch1
6. Carnethon M, Whitsel LP, Franklin BA, et al. Worksite Wellness Programs for Cardiovascular Disease Prevention: A Policy Statement From the American Heart Association. Circulation. 2009;120(17):1725-1741. doi:10.1161/CIRCULATIONAHA.109.192653
7. Task Force on Community Preventive Services. Obesity: Worksite Programs. The Community Guide. https://www.thecommunityguide.org/findings/obesity-worksite-programs. Published 2007. Accessed August 21, 2017.
8. Task Force on Community Preventive Services. Physical Activity: Enhanced School-Based Physical Education. The

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Community Guide. https://www.thecommunityguide.org/findings/physical-activity-enhanced-school-based-physical-education. Published 2013. Accessed August 21, 2017.

9. Healthy Scho. Play Well. https://cps.edu/OSHW/Documents/PlayWELL_Toolkit.pdf. Accessed June 5, 2020.
10. World Health Organization. Physical Activity. http://www.who.int/mediacentre/factsheets/fs385/en/. Published 2015. Accessed February 1, 2017.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

V07 ACTIVE FURNISHINGS | O (MAX : 2 PT)

Intent : Encourage movement, postural breaks and switching and discourage prolonged sitting or standing at stationary workstations through active workstations.

Summary : This WELL feature requires projects to provide ample active workstations, such as a sit-stand or treadmill desk.

Issue : Sedentary behavior has been linked to numerous negative health outcomes, including obesity, type 2 diabetes, cardiovascular and metabolic risks and premature mortality. [1–5] Sedentary behavior also poses health risks, despite activity levels, and may even negate the positive health effects associated with physical activity.[1,6–8]

Solutions : Active workstations have grown in popularity in commercial office environments in recent years. Active workstations are effective at decreasing time spent sitting, thereby increasing energy expenditure.[9–13] Studies do not suggest there is an impact on productivity for sit-stand or treadmill desks with more mixed findings for bicycle desks. [11,12,14–18] Evidence further suggests that offering active workstations along with education, prompts and/or behavior change counseling may support sustained behavior change and further reduce sitting time.[19–21]

PART 1 PROVIDE ACTIVE WORKSTATIONS (MAX : 2 PT)

For Office Spaces:

Active workstations meet the following requirements:

a.

Enable users to sit/stand or obtain light physical activity during use through one of the following:

i. Manual or electric height adjustments for work surface.

ii. Treadmill component.

iii. Stationary bicycle component.

iv. Step machine component.

b. Are provided in one of the following quantities:

Tier	Active Workstation Quantity	Points
1	At least 50% of workstations	1
2	At least 90% of workstations	2

REFERENCES

1. Hamilton MT, Healy GN, Dunstan DW, Zderic TW, Owen N. Too Little Exercise and Too Much Sitting: Inactivity Physiology and the Need for New Recommendations on Sedentary Behavior. Curr Cardiovasc Risk Rep. 2008;2(4):292-298. doi:10.1007/s12170-008-0054-8
2. Owen N, Salmon J, Koohsari MJ, Turrell G, Giles-Corti B. Sedentary behaviour and health: mapping environmental and social contexts to underpin chronic disease prevention. Br J Sports Med. 2014;48(3):174-177. doi:10.1136/bjsports-2013-093107
3. Young DR, Hivert M-F, Alhassan S, et al. Sedentary Behavior and Cardiovascular Morbidity and Mortality: A Science Advisory From the American Heart Association. Circulation. 2016;134(13):e262-79. doi:10.1161/CIR.0000000000000440
4. Chau JY, Grunseit AC, Chey T, et al. Daily Sitting Time and All-Cause Mortality: A Meta-Analysis. Gorlova OY, ed. PLoS One. 2013;8(11):e80000. doi:10.1371/journal.pone.0080000
5. Patterson R, McNamara E, Tainio M, et al. Sedentary behaviour and risk of all-cause, cardiovascular and cancer mortality, and incident type 2 diabetes: a systematic review and dose response meta-analysis. Eur J Epidemiol. 2018;1:1-19. doi:10.1007/s10654-018-0380-1
6. Owen N, Healy GN, Matthews CE, Dunstan DW. Too Much Sitting: The Population-Health Science of Sedentary Behavior. Exerc Sport Sci Rev. 2010;38(3):105-113. doi:10.1097/JES.0b013e3181e373a2
7. Ekelund U, Steene-Johannessen J, Brown WJ, et al. Does physical activity attenuate, or even eliminate, the detrimental association of sitting time with mortality? A harmonised meta-analysis of data from more than 1 million men and women. Lancet. 2016. doi:10.1016/S0140-6736(16)30370-1
8. Owen N, Sparling PB, Healy GN, Dunstan DW, Matthews CE. Sedentary behavior: emerging evidence for a new health risk. Mayo Clin Proc. 2010;85(12):1138-1141. doi:10.4065/mcp.2010.0444
9. Neuhaus M, Eakin EG, Straker L, et al. Reducing occupational sedentary time: A systematic review and meta-analysis of evidence on activity-permissive workstations. Obes Rev. 2014;15(10):822-838. doi:10.1111/obr.12201
10. Torbeyns T, Bailey S, Bos I, Meeusen R. Active workstations to fight sedentary behaviour. Sports Med. 2014;44(9):1261-1273. doi:10.1007/s40279-014-0202-x
11. Cao C, Liu Y, Zhu W, Ma J. Effect of Active Workstation on Energy Expenditure and Job Performance: A Systematic

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Review and Meta-analysis. J Phys Act Heal. 2016. doi:10.1123/jpah.2014-0565

12. MacEwen BT, MacDonald DJ, Burr JF. A systematic review of standing and treadmill desks in the workplace. Prev Med (Baltim). 2015;70:50-58. doi:10.1016/j.ypmed.2014.11.011
13. Heinrich A, Wasserkampf A, Schäfer A, Ellegast R, Kleinert J. Dynamic Office Workstations: Initial Insights into User Usability Evaluations and Motivation. J UOEH. 2018;40(4):277-286. doi:10.7888/juoeh.40.277
14. Carr LJ, Leonhard C, Tucker S, Fethke N, Benzo R, Gerr F. Total Worker Health Intervention Increases Activity of Sedentary Workers. Am J Prev Med. 2016;50(1). doi:10.1016/j.amepre.2015.06.022
15. Ghesmaty Sangachin M, Gustafson WW, Cavuoto LA. Effect of Active Workstation Use on Workload, Task Performance, and Postural and Physiological Responses. IIE Trans Occup Ergon Hum Factors. 2016;4(1):67-81. doi:10.1080/21577323.2016.1184196
16. Karol S, Robertson MM. Implications of sit-stand and active workstations to counteract the adverse effects of sedentary work: A comprehensive review. Work. 2015;52(2):255-267. doi:10.3233/WOR-152168
17. Commissaris DACM, Könemann R, Hiemstra-van Mastrigt S, et al. Effects of a standing and three dynamic workstations on computer task performance and cognitive function tests. Appl Ergon. 2014;45(6). doi:10.1016/j.apergo.2014.05.003
18. Garland E, Watts A, Doucette J, Foley M, Senerat A, Sanchez S. Stand Up to Work: assessing the health impact of adjustable workstations. Int J Work Heal Manag. 2018;11(2):85-95. doi:10.1108/IJWHM-10-2017-0078
19. Neuhaus M, Healy GN, Dunstan DW, Owen N, Eakin EG. Workplace sitting and height-adjustable workstations: A randomized controlled trial. Am J Prev Med. 2014;46(1). doi:10.1016/j.amepre.2013.09.009
20. Healy GN, Eakin EG, LaMontagne AD, et al. Reducing sitting time in office workers: Short-term efficacy of a multicomponent intervention. Prev Med (Baltim). 2013;57(1). doi:10.1016/j.ypmed.2013.04.004
21. Grunseit AC, Chau JY, Van der Ploeg HP, Bauman A. Thinking on your feet: A qualitative evaluation of an installation of sit-stand desks in a medium-sized workplace. J Sci Med Sport. 2013;13(1):365. doi:10.1016/j.jsams.2012.11.479

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

V08 PHYSICAL ACTIVITY SPACES AND EQUIPMENT | O (MAX : 2 PT)

Intent : Promote physical activity and exercise by providing access to physical activity spaces and equipment at no cost.

Summary : This WELL feature requires projects to provide access to a physical activity space at no cost through an on-site fitness facility, nearby facility or nearby outdoor spaces, such as a park.

Issue : International physical activity guidelines recommend both cardiovascular and muscle strengthening activities for the general population.[1] Despite widely disseminated guidelines, nearly a quarter of the general population fails to achieve recommended physical activity levels.[2] Key determinants of physical activity behavior include time, convenience, motivation, self-efficacy, weather conditions, travel and family obligations, fear of injury and lack of social support.[3,4] At a community scale, additional environmental barriers exist, such as availability of sidewalks, parks and bicycle lanes.[3,4]

Solutions : In a systematic review conducted by the U.S. Centers for Disease Control and Prevention, creating enhanced places for physical activity increased engagement and biomarkers for physical fitness, including aerobic capacity and energy expenditure, with a few studies documenting some decrease in body weight and body fat.[5] Creating space within a building for physical activity is important, along with larger efforts to design communities to encourage movement. Factors such as proximity and quality of parks are important predictors of physical activity, although more consistent research is needed.[6,7]

PART 1 PROVIDE INDOOR ACTIVITY SPACES (MAX : 1 PT)

For All Spaces:

Option 1: On-site physical activity spaces

A dedicated fitness facility is available within the project boundary at no cost to regular occupants and is sized according to one of the following requirements:

a. The space includes at least two types of exercise or sporting equipment (e.g., free weights, treadmill, yoga mat, basketball) in quantities that allow use by at least 5% of regular occupants at any time.[8]

b. The space includes at least two types of exercise or sporting equipment (e.g., free weights, treadmill, yoga mat, basketball). The minimum size is 270 ft^2 plus 1 ft^2 per regular occupant or 10,000 ft^2, whichever is smaller.[9]

OR

Option 2: Off-site physical activity spaces

The project meets the following requirement:

a. Regular occupants have access to a fitness facility at no cost within a 650 ft walking distance of the project boundary.

PART 2 PROVIDE OUTDOOR PHYSICAL ACTIVITY SPACE (MAX : 1 PT)

For All Spaces:

At least one of the following outdoor physical activity spaces is within a 0.25 mi walk distance of the project boundary and available at no cost to regular occupants:

a. Green space (e.g., park, walking/biking trail).

b. Blue space (e.g., swimming area).

c. Recreational field or court.

d. Fitness zone that includes all-weather fitness equipment.

e. For projects with child occupants, play space geared toward children (e.g., playground).

REFERENCES

1. World Health Organization. Physical Activity. http://www.who.int/mediacentre/factsheets/fs385/en/. Published 2015. Accessed February 1, 2017.
2. Sallis JF, Bull F, Guthold R, et al. Progress in physical activity over the Olympic quadrennium. Lancet. 2017;388(10051):1325-1336. doi:10.1016/S0140-6736(16)30581-5
3. Humpel N, Owen N, Leslie E. Environmental factors associated with adults' participation in physical activity. A review. Am J Prev Med. 2002;22(3):188-199. doi:10.1016/S0749-3797(01)00426-3
4. Centers for Disease Control and Prevention. Overcoming Barriers to Physical Activity. https://www.cdc.gov/physicalactivity/basics/adding-pa/barriers.html. Accessed March 7, 2018.
5. Task Force on Community Preventive Services. Physical Activity: Creating or Improving Places for Physical Activity. The Community Guide. https://www.thecommunityguide.org/findings/physical-activity-creating-or-improving-places-physical-activity. Published 2001.
6. Bancroft C, Joshi S, Rundle A, et al. Association of proximity and density of parks and objectively measured physical activity in the United States: A systematic review. Soc Sci Med. 2015;138:22-30. doi:10.1016/j.socscimed.2015.05.034
7. Han B, Cohen DA, Derose KP, Marsh T, Williamson S, Raaen L. How much neighborhood parks contribute to local residents' physical activity in the City of Los Angeles: a meta-analysis. Prev Med. 2014;69 Suppl 1:S106-10.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

doi:10.1016/j.ypmed.2014.08.033

8. U.S. Green Building Council. LEED v4 BD+C: New Construction. Innovation: Design for Active Occupants.
9. Sport England. Fitness and Exercise Spaces. http://direct.sportengland.org/media/4203/fitness-and-exercise-spaces.pdf. Published 2008. Accessed June 5, 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

V09 PHYSICAL ACTIVITY PROMOTION | O (MAX : 1 PT)

Intent : Encourage physical activity and exercise, by designing, implementing and monitoring physical activity incentive programs.

Summary : This WELL feature requires projects to provide physical activity incentives or promotion programs and monitor uptake of offerings.

Issue : Physical inactivity has emerged as a primary focus of public health, due to a rise in premature mortality and chronic diseases attributed to inactive lifestyles, including type 2 diabetes, cardiovascular disease, depression, stroke and some forms of cancer.[1,2] Physical activity is intimately tied to prevention of these chronic conditions and overall health across the lifespan.[3] In adolescent populations, physical activity is especially important for health, well-being and development.[3]

Solutions : Health promotion programs in the workplace typically take a comprehensive approach to behavior change, including environmental design and behavioral strategies. [3–5] There isn't a templatized program that can be applied and deliver results in every workplace.[3] It is, therefore, critical that projects take an integrative approach and design a program that takes into account the characteristics and preferences of the intended users. Physical activity incentives are one of many strategies that can be used. In a systematic review examining different incentives, conditional incentives – particularly those that rewarded positive physical activity behavior – were effective at improving physical activity levels as compared to unconditional incentives (e.g., subsidized memberships that do not require participation).[6] Just as workplaces are a ubiquitous platform to reach working populations, programs targeting schools are a key avenue to reach student populations.[3] In schools, some of the most common and well-recognized strategies to provide physical activity opportunities are through physical education curricula, recess, afterschool programs and sport, and activation of classrooms to incorporate more movement.[3,7–9] It's also recommended that schools incorporate programs that address sedentary behavior, such as screen time, as part of a comprehensive approach to health promotion.[10]

PART 1 OFFER PHYSICAL ACTIVITY INCENTIVES (MAX : 1 PT)

For All Spaces:

1: Incentives for eligible employees

The project or organization offers at least two of the following physical activity promotion programs to eligible employees:

a. Rewards for physical activity engagement (e.g., prizes, financial rewards).

b. A subsidy towards physical activity costs incurred by employees (e.g., membership fees or group fitness classes), including those incurred during business travel.

c. Reductions in health care premiums based on physical activity engagement.

d. Flexible work hours to accommodate physical activity.

e. Paid time off for physical activity with a minimum of four days per calendar year. Days must be used towards physical activity engagement or recovery and may not be deducted from regular paid time off or other employer-provided time off from work (e.g., sick leave, standard paid holidays).

2: Employee utilization of incentive programs

One of the following requirements is met:

a. The project or organization monitors utilization of incentive programs and demonstrates an annual utilization rate of 50% (i.e., at least 50% of eligible employees have utilized at least one incentive over the past year). Projects may report combined utilization rates across multiple incentives, as appropriate.

b. The project or organization demonstrates an annual improvement in utilization of at least 10 percentage points. Projects may report combined utilization rates across multiple incentives, as appropriate.

3: Physical activity for students

Early childhood education, primary and secondary schools develop and implement the following programs for students:

a. A program that aims to reduce daily time spent in the following sedentary behaviors:
   1. TV viewing.
   2. Recreational computer or smartphone use.
   3. Gaming.

b. A program that aims to promote daily physical activity through at least one of the following:
   1. Teaching strategies that incorporate movement and activity into the lesson.
   2. Physical education.
   3. Recess or similar physical activity breaks.

REFERENCES

1. Centers for Disease Control and Prevention. Facts about Physical Activity | Physical Activity | CDC. Centers for Disease Control and Prevention.
2. World Health Organization. Physical Activity. http://www.who.int/mediacentre/factsheets/fs385/en/. Published 2015. Accessed February 1, 2017.
3. King AC, Powell KE, Physical Activity Guidelines Advisory Committee, Committee PAGA. 2018 Physical Activity Guidelines Advisory Committee Scientific Report. 2018. https://health.gov/paguidelines/second-edition/report.aspx.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

4. Conn VS, Hafdahl AR, Cooper PS, Brown LM, Lusk SL. Meta-Analysis of Workplace Physical Activity Interventions. Am J Prev Med. 2009;37(4):330-339. doi:10.1016/j.amepre.2009.06.008
5. The Task Force on Community Preventive Services. Obesity Prevention and Control: Worksite Programs. The Community Guide.
6. Barte JCM, Wendel-Vos GCW. A Systematic Review of Financial Incentives for Physical Activity: The Effects on Physical Activity and Related Outcomes. Behav Med. 2015;43(2):1-12. doi:10.1080/08964289.2015.1074880
7. Task Force on Community Preventive Services. Physical Activity: Enhanced School-Based Physical Education. The Community Guide. https://www.thecommunityguide.org/findings/physical-activity-enhanced-school-based-physical-education. Published 2013. Accessed August 21, 2017.
8. Healthy Schools Campaign. Play Well. https://cps.edu/OSHW/Documents/PlayWELL_Toolkit.pdf. Accessed June 5, 2020.
9. Healthy Schools Campaign. Move Well. https://healthyschoolscampaign.org/wp-content/uploads/2015/07/MoveWELL_Toolkit.pdf. Accessed June 5, 2020.
10. Task Force on Community Preventive Services. Obesity: Behavioral Interventions that Aim to Reduce Recreational Sedentary Screen Time Among Children. The Community Guide. https://www.thecommunityguide.org/findings/obesity-behavioral-interventions-aim-reduce-recreational-sedentary-screen-time-among. Published 2014. Accessed August 21, 2017.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

V10 SELF-MONITORING | O (MAX : 1 PT)

Intent : Promote self-awareness of health behaviors and health metrics through wearable technology.

Summary : This WELL feature requires projects to provide or subsidize wearables that can monitor physical activity and health behaviors over time.

Issue : Much of what we understand about physical activity's relationship to health and well-being is derived from studies that utilize self-reported measures of physical activity. [1] Evidence suggests that self-reported measures tend to overestimate actual physical activity behaviors.[2]

Solutions : Objective, accelerometer-based tools that track physical activity have proliferated the marketplace.[3–5] Estimates from 2016 indicate 33% of people across 16 countries (including 20,000 individuals) used a wearable or app to track physical activity and health parameters.[3,6,7] In addition, an estimated 44.5% of employers leverage them in strategic planning of wellness programs.[8] Evidence from a systematic review conducted by the U.S. Centers for Disease Control and Prevention shows that, particularly when paired with coaching and counseling, technology tools can have a positive impact on recording reliable data and improving health outcomes.[9] In a comprehensive review led by the U.S. Physical Activity Guidelines Committee, researchers found evidence that wearable activity monitors, including simple step counters, when paired with goal-setting, were effective at increasing physical activity.[10] In a meta-analysis of several randomized controlled trials, use of a step counter paired with a step goal significantly reduced sedentary time among adults.[11] Projects should consider privacy and data security among users when they are vetting technologies to recommend to their occupants, and when projects may have access to users' wearable data.

PART 1 PROVIDE SELF-MONITORING TOOLS (MAX : 1 PT)

For All Spaces:

The project or organization provides devices (e.g., wearable fitness tracker) to all eligible employees that meet the following requirements:

a. Available at no cost or subsidized by at least 50%.

b. Allow users to monitor their own metrics over time (i.e., provides a dashboard where individual metrics are aggregated).

c. Measure at least two physical activity metrics (e.g., steps, floors climbed, activity minutes).

d. Measure at least one additional health behavior (e.g., mindfulness practice, sleep).

REFERENCES

1. Celis-Morales CA, Perez-Bravo F, Ibañez L, Salas C, Bailey MES, Gill JMR. Objective vs. Self-Reported Physical Activity and Sedentary Time: Effects of Measurement Method on Relationships with Risk Biomarkers. Dasgupta K, ed. PLoS One. 2012;7(5). doi:10.1371/journal.pone.0036345
2. Hagstromer M, Ainsworth BE, Oja P, Sjostrom M. Comparison of a subjective and an objective measure of physical activity in a population sample. J Phys Act Heal. 2010;7(4):541-550. doi:10.1123/jpah.7.4.541
3. Piwek L, Ellis DA, Andrews S, Joinson A. The Rise of Consumer Health Wearables: Promises and Barriers. PLoS Med. 2016;13(2). doi:10.1371/journal.pmed.1001953
4. Evenson KR, Goto MM, Furberg RD. Systematic review of the validity and reliability of consumer-wearable activity trackers. Int J Behav Nutr Phys Act. 2015;12(1):159. doi:10.1186/s12966-015-0314-1
5. Lee J, Finkelstein J. Activity Trackers: A Critical Review. In: Studies in Health Technology and Informatics. Vol 205. ; 2014:558-562. doi:10.3233/978-1-61499-432-9-558
6. Global Wellness Institute. Move to Be Well: The Global Economy of Physical Activity.; 2019.
7. Growth from Knowledge. Health and Fitness Tracking.; 2016. https://www.gfk.com/fileadmin/user_upload/website_content/Images/Global_Study/Fitness_tracking/Documents/G GfK-survey_Health-Fitness-Monitoring_2016_final.pdf.
8. Springbuk. Employer Guide to Wearables 2.0.; 2017. https://drive.google.com/file/d/0BwZ5mWp6wDfdME9jdTFDZkZJNEk/view. Accessed February 23, 2018.
9. Task Force on Community Preventive Services. Obesity: Technology-Supported Multicomponent Coaching or Counseling Interventions—To Maintain Weight Loss. The Community Guide. https://www.thecommunityguide.org/findings/obesity-technology-supported-multicomponent-coaching-or-counseling-interventions-maintain. Published 2009. Accessed January 10, 2018.
10. King AC, Powell KE, Physical Activity Guidelines Advisory Committee, Committee PAGA. 2018 Physical Activity Guidelines Advisory Committee Scientific Report. 2018. https://health.gov/paguidelines/second-edition/report.aspx.
11. Qiu S, Cai X, Ju C, et al. Step Counter Use and Sedentary Time in Adults: A Meta-Analysis. Antonino B, ed. Medicine (Baltimore). 2015;94(35). doi:10.1097/MD.0000000000001412

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

V11 ERGONOMICS PROGRAMMING | O (MAX : 3 PT)

Intent : Enhance well-being and comfort through comprehensive ergonomics programming.

Summary : This WELL feature requires projects to work with a certified ergonomist to implement comprehensive ergonomics programming, commit to on-going improvements to ergonomic design and provide ergonomic support for remote workers.

Issue : In 2016, musculoskeletal disorders (MSDs) ranked among the top drivers of global disability.[1,2] MSDs are one of the most commonly reported causes of lost or restricted work time and also contribute to absenteeism and low productivity among employees.[3,4] These losses amount to significant impacts for the economy at large and a business's bottom line.[5] Ergonomic issues affect many sectors from schools to industrial settings and commercial offices, each with unique, contextual risks and considerations.[6]

Solutions : Ergonomic interventions aim to support everyone and increasingly adopt a holistic approach that tackles the design of the physical environment (e.g., adjustable furniture), the work itself (e.g., process, practices) and behavior (e.g., education, training).[7,8] Ergonomic interventions have been shown to have a positive impact and a substantial return on investment (ROI). One study found that after implementing a macro-ergonomics intervention, claims over a 5-year period were reduced by 45% (200 fewer total claims) and researchers determined an ROI of 10:1 for the program. In this study, ROI calculations considered the compensation costs per claim, the number of preventive ergonomic evaluations performed and the annual cost of the program.[9] Another study examining outcomes across 250 case studies, across a variety of sectors from healthcare (36) to offices (40), manufacturing facilities (87) and other industries, found generally positive results and noted that the payback period was generally less than one year.[10]

PART 1 IMPLEMENT AN ERGONOMICS PROGRAM (MAX : 1 PT)

For All Spaces:

1: Professional ergonomics support

The project or organization meets at least one of the following requirements:

a. Engages with a qualified professional ergonomist (which may be a consultant, contractor or other third-party).

b. Has at least one qualified professional ergonomist on staff whose responsibilities include ergonomic programming, as defined in their job description and/or performance expectations.

2: Ergonomics programming

The project or organization has an ergonomics program that includes the following:

a. Annual consultation with key stakeholders (e.g., human resources, workplace wellness, occupational safety, leadership, employees) who are involved in the design, implementation and evaluation of the ergonomics program.

b. A task analysis performed by a qualified professional ergonomist to identify the job-related tasks that are performed by occupants in the space.

c. Accommodations for eligible employees to receive individual ergonomic assessments in the form of a self-assessment (e.g., reputable, third-party app), in-person assessment (e.g., at the workplace or home) or a virtual assessment (e.g., live video conference). Assessments are offered to employees at least annually and, as applicable, during or after the following events:

   1. Employee on-boarding.
   2. Substantial equipment changes (e.g., purchase of a new chair) or workstation redesign.
   3. Change in health status (e.g., injury, presentation of symptoms of musculoskeletal issues, visual strain).
   4. Change in work environment (e.g., transition to or from full-time remote work).

d. Ergonomic trainings (e.g., workshop, seminar, classes) delivered by a qualified professional ergonomist to employees at least annually.

PART 2 COMMIT TO ERGONOMIC IMPROVEMENTS (MAX : 1 PT)

Note :

Projects may only achieve this part if Part 1 is also achieved.

For All Spaces:

Option 1: Informed Ergonomic Design

The following requirement is met:

a. The project or organization describes how Part 1 informed design-decisions within Feature V02: Ergonomics Workstation Design and, as applicable, Feature V07: Active Furnishings.

OR

Option 2: Individual Ergonomic Needs

The following requirement is met:

a. The project or organization demonstrates a commitment to addressing the individual ergonomic needs of employees identified through individual ergonomics assessments.

b. The timeline for delivery of solutions is communicated to employees.

PART 3 B SUPPORT REMOTE WORK ERGONOMICS (MAX : 1 PT)

Note :

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Projects may only achieve this part if Part 1 is also achieved.

For All Spaces:

For organizations with employees who regularly work remotely, the organization tailors the ergonomic program addressed in Part 1 in the following ways:

a. For individual assessments, accommodations are made to include remote workers (e.g., virtual assessments).

b. The organization provides ergonomic equipment to support the individual needs of remote workers through direct-purchases, reimbursement or subsidies.

> **Note :** This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. Institute for Health Metrics and Evaluation (IHME). GBD Compare. 2015. http://vizhub.healthdata.org/gbd-compare.
2. Agarwal S, Steinmaus C, Harris-Adamson C. Sit-stand workstations and impact on low back discomfort: a systematic review and meta-analysis. Ergonomics. 2018. doi:10.1080/00140139.2017.1402960
3. Bevan S. Economic impact of musculoskeletal disorders (MSDs) on work in Europe. Best Pract Res Clin Rheumatol. 2015;29(3):356-373. doi:10.1016/j.berh.2015.08.002
4. Occupational Safety and Health Administration. Ergonomics - Overview. https://www.osha.gov/SLTC/ergonomics/. Accessed October 31, 2017.
5. Centers for Disease Control and Prevention. Work-Related Musculoskeletal Disorders & Ergonomics.
6. Centers for Disease Control and Prevention, The National Institute for Occupational Safety and Health. Elements of Ergonomic Programs. 1997. https://www.cdc.gov/niosh/topics/ergonomics/ergoprimer/default.html.
7. Safe Work Australia. Principles of Good Work Design. https://www.safeworkaustralia.gov.au/system/files/documents/1702/good-work-design-handbook.pdf.
8. Hedge A. Ergonomic Workplace Design for Health, Wellness, and Productivity. In: Ergonomic Workplace Design for Health, Wellness, and Productivity. ; 2016:1-443. doi:10.1201/9781315374000
9. Heller-ono A. A Prospective Study of a Macroergonomics Process over Five Years Demonstrates Significant Prevention of Workers' Compensation Claims Resulting in Projected Savings. 2009:1-4. http://worksiteinternational.com/pdf/ODAM-NES-2014-ARH-paper-Final-Submission.pdf.
10. Goggins RW, Spielholz P, Nothstein GL. Estimating the effectiveness of ergonomics interventions through case studies: Implications for predictive cost-benefit analysis. J Safety Res. 2008;39(3):339-344. doi:10.1016/J.JSR.2007.12.006

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

APPENDIX V1:

Diverse use types:[1]

Category	Use type
Food retail	Supermarket
	Grocery with a produce section
Community-serving retail	Convenience store
	Farmer's market
	Hardware store
	Pharmacy
	Other retail
Services	Bank
	Family entertainment venue (e.g., theater, sports)
	Gym, health club, exercise studio
	Hair care
	Laundry, dry cleaner
	Restaurant, café or diner (excluding those with only drive-thru service)
Civic and community facilities	Adult or senior care (licensed)
	Child care (licensed)
	Community or recreation center
	Cultural arts facility (museum, performing arts)
	Education facility (e.g., K–12 school, university, adult education center, vocational school, community college)
	Government office that serves public on-site
	Medical clinic or office that treats patients
	Place of worship
	Police or fire station
	Post office
	Public library
	Public park
	Social services center
Community anchor uses	Commercial office (100 or more full-time employees)
	Housing (100 or more dwelling units)

The following restrictions apply to Appendix V1:

1. A use may be counted as only one use-type (e.g., a single retail space may be counted only once, even if it sells products in several use categories).
2. No more than two uses in each use type may be counted (e.g., if five restaurant spaces are within the required distance, only two may be counted).

References:

1. U.S. Green Building Council. LEED BD+C: Core and Shell - Surrounding density and diverse uses. https://www.usgbc.org/credits/core-shell/v2012/ltc4. Accessed January 1, 2018.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

THERMAL COMFORT

The WELL Thermal Comfort concept aims to promote human productivity and provide a maximum level of thermal comfort among all building users through improved HVAC system design and control and by meeting individual thermal preferences.

The WELL Thermal Comfort concept aims to promote human productivity and 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."[1] Thermal comfort greatly influences our experiences in the places where we live and work[2] and is one of the highest contributing factors influencing overall human satisfaction in buildings[3–5] impacting individual levels of motivation, alertness, focus and mood.[5] 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 buildings' energy use, since cooling and heating in developed and many developing countries account for approximately half of a building's energy consumption. [6,7]

Despite technological advancements, great improvements in our understanding of thermal comfort in buildings and existing standards establishing specific criteria indicating buildings should provide an acceptable thermal environment for a minimum 80% of occupants,[8] many people still feel uncomfortable during the work day.[9,10] 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.[11] Moreover, as many as 41% of office workers have expressed dissatisfaction with their thermal environment.[11] Such levels of dissatisfaction may be detrimental not only to the individual but also the business at large, since leading research indicates that employees perform on average 15% poorer in hot conditions and on average 14% poorer in cold conditions.[12] 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.[11]

Thermal comfort is subjective, which means that not everyone will be 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.[13] 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.[14] There is a need for a holistic approach to thermal comfort that can satisfy the individual preferences of all (or nearly all) building users. When possible, personal thermal comfort devices should be used. These have been shown to improve self-reported productivity rates, decrease symptoms associated with sick building syndrome and increase thermal comfort.[15] However, due to the difficulties of setting temperature levels that suit all individual preferences,[1] thermal comfort conditions should create baseline satisfaction for the largest number of people. Overall, systems should always be designed with human-centric thermal zoning in mind, helping to optimize the system's thermal performance.[16]

The WELL Thermal Comfort concept takes a holistic approach to thermal comfort and provides a combination of research-based interventions to help design buildings that address individual thermal discomfort and support human health, well-being and productivity.

Note : Read more about the evidence behind the WELL Thermal Comfort Concept. Note: Material from the research digests is not covered on the WELL AP exam.

REFERENCES

1. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 55-2013: Thermal Environmental Conditions for Human Occupancy. 2013. https://www.techstreet.com/ashrae/standards/ashrae-55-2013?product_id=1868610.
2. Nicol JF, Humphreys MA. Adaptive thermal comfort and sustainable thermal standards for buildings. Energy Build. 2002;34(6):563-572. doi:10.1016/S0378-7788(02)00006-3
3. Frontczak M, Wargocki P. Literature survey on how different factors influence human comfort in indoor environments. Build Environ. 2011;46(4):922-937. doi:10.1016/j.buildenv.2010.10.021
4. Frontczak M, Schiavon S, Goins J, Arens E, Zhang H, Wargocki P. Quantitative relationships between occupant satisfaction and satisfaction aspects of indoor environmental quality and building design. Indoor Air. 2012;22(2):119-131. doi:10.1111/j.1600-0668.2011.00745.x
5. Lamb S, Kwok KCS. A longitudinal investigation of work environment stressors on the performance and wellbeing of office workers. Appl Ergon. 2016;52:104-111. doi:10.1016/j.apergo.2015.07.010

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

6. Chua KJ, Chou SK, Yang WM, Yan J. Achieving better energy-efficient air conditioning - A review of technologies and strategies. Appl Energy. 2013;104:87-104. doi:10.1016/j.apenergy.2012.10.037
7. Pérez-Lombard L, Ortiz J, Pout C. A review on buildings energy consumption information. Energy Build. 2008;40(3):394-398. doi:10.1016/j.enbuild.2007.03.007
8. Kim J, Schiavon S, Brager G. Personal comfort models – A new paradigm in thermal comfort for occupant-centric environmental control. Build Environ. 2018;132:114-124. doi:10.1016/j.buildenv.2018.01.023
9. Schiller G, Arens E, Bauman F, Benton C, Fountain M, Doherty T. A field study of thermal environments and comfort in office building. ASHRAE Trans. 1988;94 Part 2.
10. Putra JCP. A Study of Thermal Comfort and Occupant Satisfaction in Office Room. Procedia Eng. 2017;170:240-247. doi:10.1016/J.PROENG.2017.03.057
11. Huizenga C, Abbaszadeh S, Zagreus L, Arens EA. Air Quality and Thermal Comfort in Office Buildings: Results of a Large Indoor Environmental Quality Survey. In: Proceedings of Healthy Buildings. Vol III. ; 2006:393-397. http://escholarship.org/uc/item/7897g2f8;jsessionid=CEA1E13173D8003D5F74BD638E71785C.
12. Vimalanathan K, Babu TR. The effect of indoor office environment on the work performance, health and well-being of office workers. J Environ Heal Sci Eng. 2014;12(1). doi:10.1186/s40201-014-0113-7
13. Djongyang N, Tchinda R, Njomo D. Thermal comfort: A review paper. Renew Sustain Energy Rev. 2010;14(9):2626-2640. doi:10.1016/j.rser.2010.07.040
14. Van Hoof J. Forty years of Fanger's model of thermal comfort: Comfort for all? Indoor Air. 2008;18(3):182-201. doi:10.1111/j.1600-0668.2007.00516.x
15. Boerstra AC, Kulve M te, Toftum J, Loomans MGLC, Olesen BW, Hensen JLM. Comfort and performance impact of personal control over thermal environment in summer: Results from a laboratory study. Build Environ. 2015;87:315-326. doi:10.1016/j.buildenv.2014.12.022
16. Erickson VL, Cerpa AE. Thermovote: Participatory sensing for efficient building HVAC conditioning. In: BuildSys 2012 - Proceedings of the 4th ACM Workshop on Embedded Systems for Energy Efficiency in Buildings. New York, New York, USA: ACM Press; 2012:9-16. doi:10.1145/2422531.2422534

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

T01 THERMAL PERFORMANCE | P

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.[1,2]

Issue : The thermal environment substantially impacts a building's energy footprint, since in many countries heating and cooling account for approximately half of a building's energy consumption.[3,4] Furthermore, the indoor thermal environment is ranked as one of the strongest contributing factors to overall human satisfaction in the built environment. [5] The thermal environment not only impacts comfort and productivity, but due to its linkages to integumentary, endocrine and respiratory body systems, thermal comfort can also cause a variety of detrimental health outcomes.[1,6] Overly warm indoor spaces are linked to increases in sick building syndrome symptoms, irregular heart rate, respiratory issues, fatigue and negative mood.[7] 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.[8]

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.[9,10] For naturally conditioned buildings, the adaptive thermal comfort model correlates human comfort directly with indoor operative temperature and outdoor temperature.[11,12] Achieving thermal satisfaction among people requires some level of control over thermal comfort parameters in any given environment.

PART 1 PROVIDE ACCEPTABLE THERMAL ENVIRONMENT

For All Spaces except Commercial Kitchen Spaces:

Option 1: Performance verified environmental conditions

The following requirements are met, as applicable:

a. Mechanically conditioned regularly occupied spaces maintain thermal comfort conditions of PMV +/- 0.5 for at least 90% of occupied hours in at least 90% of regularly occupied spaces.[13]

b. Naturally conditioned regularly occupied spaces meet all the following conditions:[12]

	Prevailing Mean Outdoor Temperature, $t_{pma(out)}$	Indoor Operative Temperature	Notes
Minimum	50 °F	$t_{pma(out)}$ × 0.31 + 47.9 °F	N/A
Maximum	92 °F	$t_{pma(out)}$ × 0.31 + 60.5 °F	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

Note : Spaces with multiple occupant types may use the occupant characteristics of PMV—metabolic rate and clothing value—for the majority occupant type (e.g., a space with 30 diners and 5 servers may use the diners' metabolic rates and clothing values to determine the PMV for that space).

OR

Option 2: Long-term thermal data

The following requirements are met:

a. Project meets Feature T06 Thermal Comfort Monitoring.

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 70-77 °F for occupied hours.[14] The designed air velocity is not more than 40 fpm at 5.6 ft above the floor.

Note : Spaces with multiple occupant types may use the occupant characteristics of PMV—metabolic rate and clothing value—for the majority occupant type (e.g., a space with 30 diners and 5 servers may use the diners' metabolic rates and clothing values to determine the PMV for that space). Projects undergoing recertification which were previously awarded Feature T06 must consider all data collected since the previous certification.

OR

Option 3: Thermal comfort surveys

The following requirement is met:

a. The project achieves at least two points in Feature T02: Verified Thermal Comfort.

For Commercial Kitchen Spaces:

The following requirement is met:

a. The operative temperature in the kitchen does not exceed 80 °F.

Note :

Multifamily residential projects may achieve WELL Certification at the Bronze or Silver level without testing in dwelling units, but cannot achieve Gold or Platinum without testing in dwelling units. See Sampling Rates for Multifamily

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Residential in the WELL Performance Verification Guidebook for further details.

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

PART 2 MEASURE THERMAL PARAMETERS

For All Spaces except Dwelling Units:

Option 1: Semi-annual testing

The following requirements are met:

a. The dry-bulb temperature, relative humidity, air speed (only for projects that use elevated air speed method) and mean radiant temperature are measured in regularly occupied spaces at intervals no longer than twice per year (including once in June, July or August and once in December, January or February), and the results are submitted annually through the WELL digital platform.

b. The number and location of sampling points comply with the requirements outlined in the Performance Verification Guidebook.

> **Note :** Projects are not required to follow the device requirements or test methods described in the Performance Verification Guidebook. Permanently installed monitors may be located on interior walls rather than a minimum distance away.

OR

Option 2: Continuous monitoring

The following requirement is met:

a. Project meets Feature T06 Thermal Comfort Monitoring.

REFERENCES

1. Mendell MJ, Fisk WJ, Kreiss K, et al. Improving the health of workers in indoor environments: Priority research needs for a National Occupational Research Agenda. Am J Public Health. 2002;92(9):1430-1440. doi:10.2105/AJPH.92.9.1430
2. Fisk WJ. How IEQ affects health, productivity. ASHRAE J. 2002;44(5). http://doas-radiant.psu.edu/fisk.pdf.
3. Chua KJ, Chou SK, Yang WM, Yan J. Achieving better energy-efficient air conditioning - A review of technologies and strategies. Appl Energy. 2013;104:87-104. doi:10.1016/j.apenergy.2012.10.037
4. Pérez-Lombard L, Ortiz J, Pout C. A review on buildings energy consumption information. Energy Build. 2008;40(3):394-398. doi:10.1016/j.enbuild.2007.03.007
5. Frontczak M, Wargocki P. Literature survey on how different factors influence human comfort in indoor environments. Build Environ. 2011;46(4):922-937. doi:10.1016/j.buildenv.2010.10.021
6. Stefano Schiavon RZ. Indoor Climate and Productivity in Offices. Berkeley, CA: Federatin of European Heating, Ventilation and Air Conditioning Associations; 2008. https://www.rehva.eu/eshop/detail/no06-indoor-climate-and-productivity-in-offices.
7. Lan L, Wargocki P, Wyon DP, Lian Z. Effects of thermal discomfort in an office on perceived air quality, SBS symptoms, physiological responses, and human performance. Indoor Air. 2011;21(5):376-390. doi:10.1111/j.1600-0668.2011.00714.x
8. Cheung SS, Lee JKW, Oksa J. Thermal stress, human performance, and physical employment standards. Appl Physiol Nutr Metab. 2016;41(6):S148-S164. doi:10.1139/apnm-2015-0518
9. Fanger PO, Fanger PO. Thermal Comfort: Analysis and Applications in Environmental Engineering. Danish Technical Press; 1970. https://books.google.com/books/about/Thermal_Comfort.html?id=S0FSAAAAMAAJ.
10. De Dear R. Thermal comfort in practice. Indoor Air, Suppl. 2004;14(SUPPL. 7):32-39. doi:10.1111/j.1600-0668.2004.00270.x
11. Mora R, Bean R. Thermal comfort: Designing for people. ASHRAE J. 2018;60(2):40-46.
12. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 55-2020: Thermal Environmental Conditions for Human Occupancy. 2021. https://www.techstreet.com/ashrae/standards/ashrae-55-2020?product_id=2207271.
13. Green Building Council of Australia. Greenstar: Design & As Built. 2019. https://new.gbca.org.au/rate/rating-system/design-and-built/.
14. NABERS. NABERS Indoor Environment for Offices: Rules for Collecting and Using Data. 2015. https://www.nabers.gov.au.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

T02 VERIFIED THERMAL COMFORT | O (MAX : 3 PT)

Intent : Enhance thermal comfort and promote human productivity, by ensuring that a substantial majority of building users (above 80%) perceive their environment as thermally acceptable.

Summary : This WELL feature requires projects to provide high levels of thermal comfort, by determining 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.[1] 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[2]. Similarly, as many as 41% of office workers have expressed dissatisfaction with the thermal environment. [2,3] Building users who are satisfied with their thermal environment have been shown to be more productive in the workplace,[2] while thermal discomfort is associated with sick building syndrome symptoms and other conditions that lead to a decrease in productivity.[2,4]

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 to prioritize the steps needed to improve occupant thermal comfort satisfaction and workplace productivity. If survey results indicate that percentage of occupants dissatisfied with thermal conditions in the building exceeds the targeted thresholds, it is necessary to develop a detailed plan for action and commitment to address occupant dissatisfaction with thermal conditions.

PART 1 SURVEY FOR THERMAL COMFORT (MAX : 3 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:[1]

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 identification of thermal comfort-related issues in accordance with either:
   1. The sample survey in Appendix T1.
   2. Any pre-approved survey listed in Part 1: Administer Project Survey in Feature C04: Occupant Survey.

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	Points
1	80% of regular occupants	2
2	90% of regular occupants	3

REFERENCES

1. Kim J, Schiavon S, Brager G. Personal comfort models – A new paradigm in thermal comfort for occupant-centric environmental control. Build Environ. 2018;132:114-124. doi:10.1016/j.buildenv.2018.01.023
2. Huizenga C, Abbaszadeh S, Zagreus L, Arens EA. Air Quality and Thermal Comfort in Office Buildings: Results of a Large Indoor Environmental Quality Survey. In: Proceedings of Healthy Buildings. Vol III. ; 2006:393-397. http://escholarship.org/uc/item/7897g2f8;jsessionid=CEA1E13173D8003D5F74BD638E71785C.
3. Frontczak M, Schiavon S, Goins J, Arens E, Zhang H, Wargocki P. Quantitative relationships between occupant satisfaction and satisfaction aspects of indoor environmental quality and building design. Indoor Air. 2012;22(2):119-131. doi:10.1111/j.1600-0668.2011.00745.x
4. Wargocki P. The effects of outdoor air supply rate in an office on perceived air quality, sick building syndrome (SBS) symptoms and productivity. Indoor Air. 2000;10(4):222-236. doi:10.1034/j.1600-0668.2000.010004222.x
5. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 55-2013: Thermal Environmental Conditions for Human Occupancy. 2013. https://www.techstreet.com/ashrae/standards/ashrae-55-2013?product_id=1868610.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

T03 THERMAL ZONING | O (MAX : 2 PT)

Intent : Enhance thermal control of building occupants through the provision of thermal zones.

Summary : This WELL feature requires projects to increase thermal control of the space, by allowing control of either the conditions of a thermal zone or movement between thermal zones.

Issue : People in buildings who are satisfied with their thermal environment have been shown to be more productive in the workplace.[1,2] For instance, employees perform on average 15% poorer in hot conditions and on average 14% poorer in cold conditions.[3] An average 2% decrease in work performance per 1.8 °F of air temperature rise has been found, when the air temperature is above 77 °F.[4] On the other hand, even a 1.8 °F decrease in air temperature within the range of 68 °F-77 °F is linked to increased student performance in mathematics.[5] Furthermore, thermal comfort preferences are highly individual and can be affected by metabolism, body type, clothing and other personal factors. [6–8] These personalized factors make it nearly impossible to find a temperature that will satisfy all individuals in the same space at the same time.[9]

Solutions : Indoor air temperature can be influenced by a number of factors, including the building physics and orientation, building location and structure, occupant density, ventilation strategy and mode of operation. In the majority of buildings, the HVAC system is responsible for controlling indoor air temperature and humidity. Where temperature zoning is an option, individually controllable thermostats that enable people to set their own thermal conditions independently of other zones should be used.

PART 1 PROVIDE THERMOSTAT CONTROL (MAX : 2 PT)

For All Spaces:

The following requirements are met for at least 90% of regularly occupied spaces:

a. Control over temperature in the space is available through either:
   1. Thermostats present within the thermal zone.
   2. A digital interface accessible to occupants on a computer or phone.

b. The maximum size of each thermal zone is 650 ft^2 or 10 occupants, whichever is larger. Individual regularly occupied rooms are considered separate zones.

c.

Projects earn points based on the number of thermal zones:

Tier	Number of Zones		Number of Zones	Points
1	One per 650 ft^2	OR	One per 10 occupants	1
2	One per 320 ft^2	OR	One per 5 occupants	2

d. Temperature sensors are positioned at least 3.3 ft away from exterior walls, windows and doors, direct sunlight, air supply diffusers, mechanical fans, heaters or any other significant sources of heat or cold.

REFERENCES

1. Huizenga C, Abbaszadeh S, Zagreus L, Arens EA. Air Quality and Thermal Comfort in Office Buildings: Results of a Large Indoor Environmental Quality Survey. In: Proceedings of Healthy Buildings. Vol III. ; 2006:393-397. http://escholarship.org/uc/item/7897g2f8;jsessionid=CEA1E13173D8003D5F74BD638E71785C.
2. Frontczak M, Schiavon S, Goins J, Arens E, Zhang H, Wargocki P. Quantitative relationships between occupant satisfaction and satisfaction aspects of indoor environmental quality and building design. Indoor Air. 2012;22(2):119-131. doi:10.1111/j.1600-0668.2011.00745.x
3. Vimalanathan K, Babu TR. The effect of indoor office environment on the work performance, health and well-being of office workers. J Environ Heal Sci Eng. 2014;12(1). doi:10.1186/s40201-014-0113-7
4. Seppänen O, Fisk WJ, Faulkner D. Cost Benefit Analysis of the Night-Time Ventilative Cooling in Office Building.; 2006.
5. Haverinen-Shaughnessy U, Shaughnessy RJ. Effects of classroom ventilation rate and temperature on students' test scores. Shaman J, ed. PLoS One. 2015;10(8):e0136165. doi:10.1371/journal.pone.0136165
6. Nicol JF, Raja IA, Allaudin A, Jamy GN. Climatic variations in comfortable temperatures: The Pakistan projects. Energy Build. 1999;30(3):261-279. doi:10.1016/S0378-7788(99)00011-0
7. de Dear RJ, Brager GS. Developing an adaptive model of thermal comfort and preference. ASHRAE Trans. 1998;104(Pt 1A):145-167.
8. Nicol JF, Humphreys MA. Adaptive thermal comfort and sustainable thermal standards for buildings. Energy Build. 2002;34(6):563-572. doi:10.1016/S0378-7788(02)00006-3

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

9. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 55-2013: Thermal Environmental Conditions for Human Occupancy. 2013. https://www.techstreet.com/ashrae/standards/ashrae-55-2013?product_id=1868610.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

T04 INDIVIDUAL THERMAL CONTROL | O (MAX : 3 PT)

Intent : Maximize and personalize thermal comfort among all individuals.

Summary : This WELL feature requires projects to improve thermal comfort of people in the space through the provision of personal thermal comfort devices and flexible dress codes that support individual thermal preferences.

Issue : Many thermal comfort standards (such as ASHRAE 55) aim to provide a thermal environment, where at minimum 80% of people will perceive the thermal environment as acceptable.[1] Due to the individualized nature of thermal comfort, not everyone will be equally comfortable under the same environmental conditions. Besides the six primary factors of thermal comfort, many secondary factors, such as age, sex, health condition, personal thermal adaptation and thermal history, including climatological origin, are considered as major secondary factors.[2–5]Factors, such as temperament, preferences, social and cultural norms and seasonal variation also play an important role in determining individual thermal comfort.[6,7]

Solutions : Adopting holistic approaches through the provision of individual thermal control devices results in improved individual thermal comfort and in the expansion of the thermal comfort acceptability limits.[6,8] Individual thermal control also allows for a broader range of recommended indoor air temperatures, which is linked to energy savings potential. [9–11] In larger shared spaces, use of personalized equipment is a good strategy to give people the ability to better control their sensation and comfort.[12–14] For example, the use of a chair equipped with fans allows the room air temperature to increase without compromising thermal comfort.[15–17] In addition, flexible dress codes are important, because clothing insulation is also one of the primary forms of intervention for addressing suboptimal thermal conditions.[18]

PART 1 PROVIDE PERSONAL COOLING OPTIONS (MAX : 1 PT)

For All Spaces except Dwelling Units:

The project provides all regular occupants with the ability to cool their individual environment through at least one of the following:[1]

a. A user-adjustable thermostat, which controls the environment for no more than one person and is connected to the building's mechanical cooling system or a more localized air conditioning unit.

b. A desk, standing, pedestal or ceiling fan that does not increase air speed for other occupants.

c. Chair with mechanical cooling system.

d. Any other solution capable of affecting a PMV change of -0.5 within 15 minutes from activation, without changing the PMV for other occupants.

PART 2 PROVIDE PERSONAL HEATING OPTIONS (MAX : 1 PT)

For All Spaces except Commercial Kitchen Spaces & Dwelling Units:

The project provides all regular occupants with the ability to warm their individual environment through at least one of the following:[1]

a. A user-adjustable thermostat, which controls the environment for no more than one person and is connected to the building's mechanical heating system.

b. Electric parabolic space heater.

c. Electric heated chair or footwarmers.

d. Personal or shared blankets. Shared blankets are washed or disinfected at least weekly after use.

e. Any other solution capable of affecting a PMV change of +0.5 within 15 minutes from activation, without changing PMV for other occupants.

PART 3 ALLOW FLEXIBLE DRESS CODE (MAX : 1 PT)

For All Spaces except Commercial Kitchen Spaces & Dwelling Units:

The following requirement is met:

a. A flexible dress code policy is in place that allows regular occupants to dress for individual thermal preferences.[19]

REFERENCES

1. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE 55-2020: Thermal Environmental Conditions for Human Occupancy. 2021. https://www.techstreet.com/ashrae/standards/ashrae-55-2020?product_id=2207271.
2. Ning H, Wang Z, Zhang X, Ji Y. Adaptive thermal comfort in university dormitories in the severe cold area of China. Build Environ. 2016;99:161-169. doi:10.1016/j.buildenv.2016.01.003
3. Luo M, Ji W, Cao B, Ouyang Q, Zhu Y. Indoor climate and thermal physiological adaptation: Evidences from migrants with different cold indoor exposures. Build Environ. 2016;98:30-38. doi:10.1016/j.buildenv.2015.12.015
4. van Hoof J, Schellen L, Soebarto V, Wong JKW, Kazak JK. Ten questions concerning thermal comfort and ageing. Build Environ. 2017;120(1):123-133. doi:10.1016/j.buildenv.2017.05.008
5. Van Hoof J. Forty years of Fanger's model of thermal comfort: Comfort for all? Indoor Air. 2008;18(3):182-201. doi:10.1111/j.1600-0668.2007.00516.x
6. Nicol F, Humphreys M. Maximum temperatures in European office buildings to avoid heat discomfort. Sol Energy.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

2007;81(3):295-304. doi:10.1016/j.solener.2006.07.007

7. de Dear RJ, Brager GS. Developing an adaptive model of thermal comfort and preference. ASHRAE Trans. 1998;104(Pt 1A):145-167.
8. Rupp RF, Vásquez NG, Lamberts R. A review of human thermal comfort in the built environment. Energy Build. 2015;105:178-205. doi:10.1016/j.enbuild.2015.07.047
9. Zhang H, Arens E, Pasut W. Air temperature thresholds for indoor comfort and perceived air quality. Build Res Inf. 2011;39(2):134-144. doi:10.1080/09613218.2011.552703
10. Sekhar SC. Higher space temperatures and better thermal comfort - a tropical analysis. Energy Build. 1995;23(1):63-70. doi:10.1016/0378-7788(95)00932-N
11. Schiavon, S. & Melikov A. Energy saving and improved comfort by increased air movement. Energy Build. 2008;40(10):313-360. https://www.sciencedirect.com/science/article/pii/S0378778808001084.
12. Pan CS, Chiang HC, Yen MC, Wang CC. Thermal comfort and energy saving of a personalized PFCU air-conditioning system. Energy Build. 2005;37(5):443-449. doi:10.1016/j.enbuild.2004.08.006
13. Gao C, Kuklane K, Wang F, Holmér I. Personal cooling with phase change materials to improve thermal comfort from a heat wave perspective. Indoor Air. 2012;22(6):523-530. doi:10.1111/j.1600-0668.2012.00778.x
14. Pasut W, Zhang H, Arens E, Zhai Y. Energy-efficient comfort with a heated/cooled chair: Results from human subject tests. Build Environ. 2015;84:10-21. doi:10.1016/j.buildenv.2014.10.026
15. Watanabe S, Shimomura T, Miyazaki H. Thermal evaluation of a chair with fans as an individually controlled system. Build Environ. 2009;44(7):1392-1398. doi:10.1016/j.buildenv.2008.05.016
16. Schiavon, S., Yang, B., Donner, Y., Chang, VW, & Nazaroff W. Thermal comfort, perceived air quality and cognitive performance when personally controlled air movement is used by tropically accllimatized persons. Indoor Air. 2016;27(3):609-702. doi:10.1111/ina.12046
17. Zhang H, Arens E, Zhai Y. A review of the corrective power of personal comfort systems in non-neutral ambient environments. Build Environ. 2015;91:15-41. doi:10.1016/j.buildenv.2015.03.013
18. Nicol JF, Humphreys MA. Thermal Comfort As Part of a Self-Regulating System. Build Res Pr. 1973;1(3):174-179. doi:10.1080/09613217308550237
19. Health and Safety Executive. Thermal Comfort. https://www.hse.gov.uk/temperature/thermal/index.htm. Published 1999.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

T05 RADIANT THERMAL COMFORT | O (MAX : 2 PT)

Intent : Maximize volume of the space, reduce dust transmission, improve ventilation control and increase thermal comfort by incorporating radiant heat and cooling systems into the building design.

Summary : This WELL feature requires projects to use radiant systems and independently controlled ventilation systems.

Issue : Mean radiant temperature is one of the six core thermal comfort parameters. It is influenced by a surface material's ability to absorb or emit radiant heat, the extent to which the surface area is exposed to the person (view factor) and the temperatures of the surrounding objects. Uniform thermal radiation may be disrupted by cold windows, uninsulated walls, equipment and improperly sized heating panels, causing local thermal discomfort.[1] In addition, conventional "all-air" systems have a higher risk of draft discomfort, due to elevated indoor air velocity.[2] Studies show occupants have a 50% probability of indoor temperature satisfaction in spaces with radiant systems, compared to conventional "all-air" systems. [3]

Solutions : Radiant heating systems are designed to affect mean radiant temperature, and thus the heat exchange with the people in the space, by supplying heat directly to the surrounding surfaces of the floors, walls and ceilings. With radiant systems, the heat transfer due to radiation increases, while the heat transfer due to convection decreases. Buildings with radiant systems have the advantage of quiet operation, low energy consumption and the capability of design integration with an independent ventilation system.[4] Coupling a radiant system with a dedicated air system separates the twofold role of the mechanical system controlling both heating/cooling and ventilation allowing for better control of the thermal environment. The use of radiant heating and cooling also reduces the number of allergens circulated in the air, since this type of system does not use forced air to distribute heating or cooling.

PART 1 IMPLEMENT RADIANT HEATING (MAX : 1 PT)

For All Spaces:

At least 50% of the regularly occupied project area is heated with one or more of the following:

a. Radiant ceilings, walls or floors.

b. Radiant panels which cover at least half of the wall or ceiling to which they are attached (does not include steam radiators).

PART 2 IMPLEMENT RADIANT COOLING (MAX : 1 PT)

For All Spaces:

At least 50% of the regularly occupied project area is cooled with one or more of the following:

a. Radiant ceilings, walls or floors.

b. Radiant panels that cover at least half of the wall or ceiling to which they are attached.

REFERENCES

1. American Society of Heating Refrigerating and Air-Conditioning Engineers. ASHRAE Handbook: fundamentals. 2017. https://www.ashrae.org/technical-resources/ashrae-handbook/description-2017-ashrae-handbook-fundamentals.
2. Karmann C, Schiavon S, Bauman F. Thermal comfort in buildings using radiant vs. all-air systems: A critical literature review. Build Environ. 2017;111:123-131. doi:10.1016/j.buildenv.2016.10.020
3. Karmann C, Schiavon S, Graham LT, Raftery P, Bauman F. Comparing temperature and acoustic satisfaction in 60 radiant and all-air buildings. Build Environ. 2017;126(January 2018):431-441. doi:10.1016/j.buildenv.2017.10.024
4. Rhee KN, Olesen BW, Kim KW. Ten questions about radiant heating and cooling systems. Build Environ. 2017;112:367-381. doi:10.1016/j.buildenv.2016.11.030

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

T06 THERMAL COMFORT MONITORING | O (MAX : 1 PT)

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

Summary : This WELL feature requires projects to monitor thermal comfort parameters using sensors in their buildings that can be used as feedback for building managers and users to take appropriate actions.

Issue : Unfavorable levels of heat, humidity and ventilation are associated with people's experience of itchy eyes, headache and throat irritation.[1] 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 in order 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 to 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 MONITOR THERMAL ENVIRONMENT (MAX : 1 PT)

For All Spaces:

1: Thermal comfort monitors

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 5400 ft^2 zone of regularly occupied space.
   2. A website or mobile application, with at least one sign located in each 5400 ft^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.

REFERENCES

1. Bluyssen PM, Roda C, Mandin C, et al. Self-reported health and comfort in “modern” office buildings: First results from the European OFFICAIR study. Indoor Air. 2016;26(2):298-317. doi:10.1111/ina.12196

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

T07 HUMIDITY CONTROL | 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 is generally uninfluential.[1] However, in warm temperature settings, humidity can influence the degradation of building materials, the ability of the human body to release heat through evaporation and the level of discomfort from excess moisture on the skin.[1–3] If the humidity is too high, the human body has a limited capacity to cool down through sweating.[4] Warm and humid indoor spaces are also associated with mold and fungal growth.[5] 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.[5] Conversely, cold and dry spaces can lead discomfort and irritation of the airways, skin, eyes, throat and mucous membranes[6] and facilitate the spread of the influenza virus.[7,8]

Solutions : Buildings situated in climates with broad humidity ranges can maintain relative humidity within healthy and comfortable levels, by adding or removing moisture from the air.[9]

PART 1 MANAGE RELATIVE HUMIDITY (MAX : 1 PT)

For All Spaces:

Option 1: Mechanical humidity control

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.[10,11]

OR

Option 2: Humidity modeling

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

a. The modeled relative humidity levels in the space are between 30% and 60% for at least 98% of all business hours of the year.

OR

Option 3: Long-term humidity data

The following requirements are met:

a. Project meets Feature T06: Thermal Comfort Monitoring.

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

Note : Projects undergoing recertification, which were previously awarded Feature T06, must consider all data collected since the previous (re)certification

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

REFERENCES

1. Jing S, Li B, Tan M, Liu H. Impact of relative humidity on thermal comfort in a warm environment. Indoor Built Environ. 2013;22(4):598-607. doi:10.1177/1420326X12447614
2. Nematchoua MK, Orosa JA. Building construction materials effect in tropical wet and cold climates: A case study of office buildings in Cameroon. Case Stud Therm Eng. 2016;7:55-65. doi:10.1016/j.csite.2016.01.007
3. Petrofsky JS, Berk L, Alshammari F, et al. The interrelationship between air temperature and humidity as applied locally to the skin: The resultant response on skin temperature and blood flow with age differences. Med Sci Monit. 2012;18(4):CR201-CR208. doi:10.12659/MSM.882619
4. Allen J, Bernstein A, Cao X, et al. Building Evidence for Health. The 9 Foundations of a Healthy Building. Sch Public Heal. 2017:35.
5. Arundel A V., Sterling EM, Biggin JH, Sterling TD. Indirect health effects of relative humidity in indoor environments. Environ Health Perspect. 1986;VOL. 65(3):351-361. doi:10.1289/ehp.8665351
6. Wolkoff P, Kjærgaard SK. The dichotomy of relative humidity on indoor air quality. Environ Int. 2007;33(6):850-857. doi:10.1016/j.envint.2007.04.004
7. Mbithi JN, Springthorpe VS, Sattar SA. Effect of relative humidity and air temperature on survival of hepatitis A virus on environmental surfaces. Appl Environ Microbiol. 1991;57(5):1394-1399.
8. Casanova LM, Jeon S, Rutala WA, Weber DJ, Sobsey MD. Effects of air temperature and relative humidity on coronavirus survival on surfaces. Appl Environ Microbiol. 2010;76(9):2712-2717. doi:10.1128/AEM.02291-09
9. U.S. Environmental Protection Agency. Mold. https://www.epa.gov/mold.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

10. U.S. Environmental Protection Agency. A Brief Guide to Mold, Moisture and Your Home.; 2012. https://www.epa.gov/sites/production/files/2016-10/documents/moldguide12.pdf.
11. European standards committee. PrEN 16798-1:2015 Indoor Environmental Input Parameters for Design and Assessment of Energy Performance of Buildings Addressing Indoor Air Quality, Thermal Environment, Lighting and Acoustics. Vol 3. European committee for Standardization; 2015.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

T08 B ENHANCED OPERABLE WINDOWS | O (MAX : 1 PT)

Intent : Provide the benefits of increased outdoor air supply while minimizing any resulting thermal discomfort.

Summary : This WELL feature requires windows that can be opened at different elevations to provide desired air flow at different outdoor temperatures.

Issue : Although use of personally controlled operable windows can improve satisfaction with the indoor air quality and thermal comfort, it may also have negative aspects if outdoor air is polluted or if outdoor weather is very hot or cold.[1–3] In cold weather, large openings in windows near occupants can lead to unpleasant draft.

Solutions : Windows which can be opened in multiple modes may provide thermal comfort over a variety of weather conditions. Large openings near the level of the occupants can provide high levels of air exchange and potentially increased air speed and corresponding cooling effect. Small openings near the ceiling allow some air exchange to take place while minimizing the potential for draft, allowing the outdoor air to warm before it reaches the occupants.[4]

PART 1 PROVIDE WINDOWS WITH MULTIPLE OPENING MODES (MAX : 1 PT)

Note : Projects may only achieve this part if Feature A07 Part 1 is also achieved.

For All Spaces:

1: Window design

Operable windows may be opened according to the following requirements (windows which may be opened in both modes may count for both requirements a and b):

a. At least 70% of operable windows may be opened such that at least half of the opening is not more than 5.9 ft above the finished floor and opening is at least 1 ft in the smallest dimension. At least one such window is present in each room with operable windows.

b. If project is equipped with heating, at least 30% of operable windows may be opened such that entirety of opening is at least 5.9 ft above the finished floor (preferably as close to the ceiling as possible).[5] At least one such window is present in each room with operable windows.

c. Controls for window operation are positioned not more than 5.6 ft above the finished floor.

Note : This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

2: Window operation

Instructions for window operation are provided through signage or other communications to regular occupants to indicate the following:

a. Windows with low openings are to be used during mild and/or warm weather.

b. Windows are not to be opened when mechanical cooling is in operation (not required if no mechanical cooling is present or if mechanical cooling system is configured to disengage automatically when windows are open).

c. Windows with high openings (if present) are to be used in cold weather.

REFERENCES

1. Burge S, Hedge A, Wilson S, Bass JH, Robertson A. Sick building syndrome: A study of 4373 office workers.*Ann Occup Hyg*. 1987;31(4 A):493-504. doi:10.1093/annhyg/31.4A.493
2. Horr, A., Kaushik, A., Mazroei, A., Katafygiotou, A. & Elsarrag E. Occupant productivity and office indoor environment quality : a review of the literature Occupant Productivity and Office Indoor Environment Quality : A Review of the Literature. 2016. http://usir.salford.ac.uk/39106/3/BAE-D-16-00533_final%2520manuscript%5B1%5D.pdf.
3. Brager GS. Benefits of Improving Occupant Comfort and Well-being in Buildings. In: *Proceedings of the 4th International Holcim Forum for Sustainable Construction: The Economy of Sustainable Construction*. Mumbai; 2013:181–194. https://src.lafargeholcim-foundation.org/dnl/93603859-d59e-498a-b056-405d16e39171/F13_OrangeWS_Brager.pdf.
4. Van den Engel PJW, Kurvers SR. The scope of inducing natural air supply via the façade. *Archit Sci Rev*. 2017;60(3):215-224. doi:10.1080/00038628.2017.1300765
5. Rijksdienst voor Ondernemend Nederland. *Programma van Eisen Frisse Scholen 2015 – Versie September 2015 (Program of Requirements Fresh Schools)*. Nederland; 2015.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

T09 B OUTDOOR THERMAL COMFORT | O (MAX : 3 PT)

Intent : Address the thermal comfort needs of project occupants in the exterior spaces of the project.

Summary : This WELL feature requires projects to design outdoor spaces to avoid excessive wind and manage elevated temperatures through shading or other strategies.

Issue : As communities expand, development takes the place of natural features of the landscape. By replacing open spaces and vegetation with structures built of materials that retain heat, a phenomenon known as the urban heat island has developed in the urban landscape.[1,2] The most prominent feature of an urban heat island is a sustained elevated temperature when compared to the immediately surrounding suburban or undeveloped areas.[3] This can lead to adverse health outcomes such as heat-related illness, fatigue, increased breathing and increased heart rate.[1,4] In addition, high-rise buildings also can concentrate prevailing winds to higher speeds that result in pedestrian discomfort and dangerous conditions. [5]

Solutions : Various strategies can be used to mitigate urban heat island effects and improve outdoor thermal comfort, including adding vegetation, providing shading structures, increasing reflectance of building materials and introducing water features.[6] The use of trees or vegetation facilitates evapotranspiration and provides shade, contributing to lower surface and air temperatures.[1] Co-benefits of introducing urban vegetation and green spaces include improved air quality, water quality (often via improved stormwater management) and savings in energy.[7] Shelter canopies address solar radiation and provide relief to thermal stress in extreme temperatures. A shaded surface can be up to 25 °C [45 °F] cooler than the peak temperature of a nearby unshaded surface.[7] Reducing surface temperatures of sidewalks, roadways and parking lots can be effectively achieved through a mixture of shading and high-albedo paving materials.[8–10] Finally, water bodies can have a positive effect on microclimates in urban areas by moderating extreme temperatures. Small water bodies such as fountains, pools and ponds can regulate temperature fluctuations and help improve thermal comfort during days of extreme heat.[11,12] Studies suggest that temperatures around and downwind of water bodies can be 1–2°C [2–4°F] lower compared to surrounding areas.[12] Computational fluid dynamics programs and other modeling tools can be used to predict the thermal conditions and likelihood of excessive wind and the effectiveness of countermeasures.[5,13]

PART 1 MANAGE OUTDOOR HEAT (MAX : 1 PT)

For All Spaces:

Option 1: Outdoor shading

The following areas (if present) are shaded for more than half of daylight hours each day by tree canopies, awnings, or other structures:

a. At least 50% of pedestrian pathways and building entrances.

b. At least 25% of parking spaces (if present).

c. At least 25% of all plazas, seating areas, exercise facilities with a contiguous area of less than 2500 ft^2 and other outdoor areas of congregation.

OR

Option 2: Temperature modeling

For pedestrian pathways and building entrances, parking spaces, and plazas, seating areas, exercise facilities with a contiguous area of less than 2500 ft^2 and other outdoor areas of congregation, project provides the following:

a. Highest expected measure of thermal perception for each month (e.g., highest Physiologically Equivalent Temperature, highest Universal Thermal Climate Index).

b. If the highest measure of thermal perception is associated with “moderate” (or more severe) heat stress, a list of countermeasures within at least two of the following categories and the expected reduction in heat stress that they provide:

   1. Landscaping and greenery.
   2. Manufactured shading systems (e.g., canopies).
   3. Reflectance of manufactured surfaces (e.g., sidewalks, rooftops).
   4. Water features (e.g., ponds, fountains).

Note :
Interior projects may achieve this part if the grounds of the base building meet the requirements, even if they are outside of the interior project boundary.

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 2 AVOID EXCESSIVE WIND (MAX : 1 PT)

For All Spaces:

A computational fluid dynamic model of the building and any adjacent buildings that takes into account at least one day per season (i.e., per quarter) demonstrates the following:

a. Winds are not expected to exceed 11 mph for more than 5% of hours in the year in seating areas or 10% of hours on paths and parking lots.[14]

b. Winds are not expected to exceed 33 mph on paths, parking lots or seating areas for more than 0.05% of hours in the year.[14]

Note :
Interior projects may achieve this part if the grounds of the base building meet the requirements, even if they are outside of the interior project boundary.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 3 SUPPORT OUTDOOR NATURE ACCESS (MAX : 1 PT)

For All Spaces:

Project achieves the following features:

a. Feature T09β Outdoor Thermal Comfort, Part 1 or Part 2.

b. Feature M09, Part 2: Provide Nature Access Outdoors.

> **Note :** This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. Environmental Protection Agency. Heat Island Cooling Strategies | Heat Island Effect | US EPA.
2. UCAR Center for Science Education. Urban Heat Islands | UCAR Center for Science Education.
3. Environmental Protection Agency. Reducing Urban Heat Islands: Compendium of Strategies - Urban Heat Island Basics. Washington, DC; 2008.
4. Zhang L, Wei D, Hou Y, et al. Outdoor Thermal Comfort of Urban Park—A Case Study. Sustainability. 2020;12(5):1961. doi:10.3390/su12051961
5. Blocken B, Carmeliet J. Pedestrian wind conditions at outdoor platforms in a high-rise apartment building: generic sub-configuration validation, wind comfort assessment and uncertainty issues. Wind Struct. 2008;11(1):51-70.
6. Nouri AS, Costa JP, Santamouris M, Matzarakis A. Approaches to outdoor thermal comfort thresholds through public space design: A review. Atmosphere (Basel). 2018;9(3). doi:10.3390/atmos9030108
7. Environmental Protection Agency. Using Trees and Vegetation to Reduce Heat Islands | Heat Island Effect | US EPA.
8. Karlessi T, Santamouris M, Apostolakis K, Synnefa A, Livada I. Development and testing of thermochromic coatings for buildings and urban structures. Sol Energy. 2009;83(4):538-551. doi:10.1016/j.solener.2008.10.005
9. Levinson R, Akbari H, Berdahl P, Wood K, Skilton W, Petersheim J. A novel technique for the production of cool colored concrete tile and asphalt shingle roofing products. Sol Energy Mater Sol Cells. 2010;94(6):946-954. doi:10.1016/j.solmat.2009.12.012
10. Marceau ML, Vangeem MG. Solar Reflectance of Concretes for LEED Sustainable Sites Credit: Heat Island Effect.; 2007.
11. Spronken‐Smith RA, Oke TR, Lowry WP. Advection and the surface energy balance across an irrigated urban park. Int J Climatol. 2000;20(9):1033-1047. doi:10.1002/1097-0088(200007)20:9<1033::AID-JOC508>3.0.CO;2-U
12. Coutts AM, Tapper NJ, Beringer J, Loughnan M, Demuzere M. Watering our cities. Prog Phys Geogr Earth Environ. 2013;37(1):2-28. doi:10.1177/0309133312461032
13. Park S, Tuller SE, Jo M. Application of Universal Thermal Climate Index (UTCI) for microclimatic analysis in urban thermal environments. Landsc Urban Plan. 2014;125:146-155. doi:10.1016/j.landurbplan.2014.02.014
14. Netherlands Standards. NEN 8100 : 2006 - Wind Comfort and Wind Danger in the Built Environment.; 2006.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

APPENDIX T1:

Surveys may be administered via paper-based surveys distributed to occupants or through a digital survey such as a website or mobile application. It is recommended that surveys are administered during mid-morning or mid-afternoon, at least 30 minutes after arrival or after a lunch break.

Survey Questionnaire:

Please answer the following questions regarding your general thermal experience during the current heating/cooling season.

1. Please rate your satisfaction level with the thermal environment in this space:

- ☐ Very Dissatisfied
- ☐ Dissatisfied
- ☐ Slightly Dissatisfied
- ☐ Neutral
- ☐ Slightly Satisfied
- ☐ Satisfied
- ☐ Very Satisfied

2. Would you prefer this area to be:

- ☐ Cooler
- ☐ Slightly Cooler
- ☐ No Change Required
- ☐ Slightly Warmer
- ☐ Warmer

If your answer to Question 1 contains the word "Dissatisfied," please answer the following two questions:

3. How do you generally perceive the thermal environment in this area:

- ☐ Cold
- ☐ Cool
- ☐ Slightly Cool
- ☐ Neutral
- ☐ Slightly Warm
- ☐ Warm
- ☐ Hot

4. Please mark the potential source (or sources) of your thermal discomfort:

- ☐ Inappropriate room thermostat setpoint temperature
- ☐ Thermostat setpoint temperature being adjusted by occupants
- ☐ Daily variations in room temperature (such as higher temperature in the afternoons)
- ☐ Occasional variations in room temperature (such as being occasionally warm or cold)
- ☐ Parts of the room being too hot
- ☐ Parts of the room being too cold
- ☐ Humidity level is too high
- ☐ Dry air
- ☐ Air movement is too high

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

☐ Air movement is too low

☐ Hot/cold air coming from windows

☐ Hot/cold walls

☐ Solar radiation

☐ Local thermal discomfort (part/parts of the body being cold or hot)

☐ Heat from equipment and appliances

☐ Strict dress code

☐ Hot/cold furniture surfaces

☐ Furniture causing hot/cold thermal discomfort or sweating

☐ Others

Example of Result Analysis:

The Percentage of Satisfaction should be reported as the percentage of people who are satisfied with the thermal environment of the space as shown in the following equation:

Percentage of Satisfaction = (Number of Satisfied Occupants)/(Number of Surveyed Occupants)•100

Occupants voting for "Neutral," "Slightly Satisfied," "Satisfied," and "Very Satisfied" should be deemed satisfied with the room's thermal environment. Table 1 shows the results from a typical survey and Table 2 depicts a simple example of the survey report. The results of question 2 (and question 3 if applicable) should be submitted as the number of votes for each thermal sensation and preferences condition as specified in Table 2.

Table 1: Results from a Typical Thermal Comfort Satisfaction Survey with 15 Participants

	Question 1	Question 2	Question 3	Question 4
Subject 1	Very Satisfied	No Change		
Subject 2	Satisfied	Slightly Cooler		
Subject 3	Slightly Dissatisfied	Warmer	Cold	Parts of the room being too cold
Subject 4	Slightly Dissatisfied	Slightly Warmer	Cool	Hot/Cold air coming from windows
Subject 5	Satisfied	No Change		
Subject 6	Very Satisfied	No Change		
Subject 7	Neutral	Slightly Warmer		
Subject 8	Very Satisfied	No Change		
Subject 9	Dissatisfied	Warmer	Slightly Cool	Inappropriate room thermostat setpoint temperature
Subject 10	Slightly Satisfied	Slightly Cooler		
Subject 11	Neutral	Slightly Warmer	Slightly Cool	Hot/Cold air coming from windows
Subject 12	Slightly Satisfied	Slightly Warmer		
Subject 13	Very Satisfied	No Change		
Subject 14	Slightly Satisfied	Slightly Warmer		
Subject 15	Satisfied	No Change		

Table 2: A typical Thermal Comfort Satisfaction Survey Report

1. Please rate your satisfaction level with the temperature in this room:						
Considered Dissatisfied			Considered Satisfied			
Very Dissatisfied	Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Satisfied	Very Satisfied
0	1	2	2	3	3	4
Percentage of Occupant Satisfaction:						
80%						
2. Would you prefer this area to be (based on the number of votes):						

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Cooler	Slightly Cooler	No Change	Slightly Warmer	Warmer
0	2	6	5	2

3. How do you generally perceive the thermal environment in this area (based on the number of votes):

Cold	Cool	Slightly Cool	Neutral	Slightly warm	Warm	Hot
1	1	2	0	0	0	0

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

SOUND

The WELL Sound concept 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 an occupant in a given environment.[1,2] 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 have been shown to hinder the health and well-being of people in a number of different ways.[3,4] 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.[5–10] 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.[11] A number of studies have also indicated that internally generated noise is a major cause of complaint and ultimately results in occupant dissatisfaction.[1,12–15]

Sound within an enclosed space from sources, such as HVAC equipment, appliances and other occupants has been shown to hinder productivity, focus, memory retention and mental arithmetic in school children, university students and workplace occupants.[9,13,14,16–19] In addition to airborne noise sources, impact of noise from adjacent activity, such as footfall, exercise or mechanical equipment vibration can create uncomfortable environments for occupants located nearby.[16,20] 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.[21] Inappropriate reverberation times and background sound levels in a space can impede speech intelligibility and cause strain for occupants who may possess hearing impairments.[22–25] 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.[26]

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.[14,16,27] 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.[16] With the fortification of façade elements, exterior noise intrusion can be subdued, much to the benefit of occupant comfort, health and productivity.[5,7,28–33] Adding mass and glazing to partition elements, sealing gaps at connections and doors and providing airspace between enclosed spaces bolsters sound privacy and increases occupant comfort.[32,34,35] 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.[22,36–38] Consistent background sound levels can be introduced into a space using a sound masking system, thus improving the signal-to-noise ratio in favor of acoustical privacy between occupants.[15]

The WELL Sound concept aims to provide a comprehensive and holistic approach to addressing the concerns of acoustical comfort through research-based design considerations that buildings can accommodate for the purposes of improving occupant health and well-being.

Note : Read more about the evidence behind the WELL Sound Concept. Note: Material from the research digests is not covered on the WELL AP exam.

REFERENCES

1. Banbury SP, Berry DC. Office noise and employee concentration: Identifying causes of disruption and potential improvements. Ergonomics. 2005;48(1):25-37. Reference
2. Sailer U, Hassenzahl M. Assessing noise annoyance: An improvement-oriented approach. Ergonomics. 2000;43(11):1920-1938. Reference
3. Hänninen O, Knol A. European Perspective on Environmental Burden of Disease–Estimates for Nine Stressors in Six European Countries. Natl Inst Heal Welfare Rep. 2011:95. Reference.
4. Lamb S, Kwok KCS. A longitudinal investigation of work environment stressors on the performance and wellbeing of office workers. Appl Ergon. 2016;52:104-111. Reference

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

5. Fyhri A, Aasvang GM. Noise, sleep and poor health: Modeling the relationship between road traffic noise and cardiovascular problems. Sci Total Environ. 2010;408(21):4935-4942. Reference
6. Bluhm GL, Berglind N, Nordling E, Rosenlund M. Road traffic noise and hypertension. Occup Environ Med. 2007;64(2):122-126. Reference
7. Jarup L, Babisch W, Houthuijs D, et al. Hypertension and exposure to noise near airports: the HYENA study. Env Heal Perspect. 2008;116(3):329-333. Reference
8. Chang TY, Lai YA, Hsieh HH, Lai JS, Liu CS. Effects of environmental noise exposure on ambulatory blood pressure in young adults. Environ Res. 2009;109(7):900-905. Reference
9. Belojević G, Öhrström E, Rylander R. Effects of noise on mental performance with regard to subjective noise sensitivity. Int Arch Occup Environ Health. 1992;64(4):293-301. Reference
10. Babisch W. Updated exposure-response relationship between road traffic noise and coronary heart diseases: A meta-analysis. Noise Heal. 2014;16(68):1. Reference
11. Babisch W, Beule B, Schust M, Kersten N, Ising H. Traffic noise and risk of myocardial infarction. Epidemiology. 2005;16(1):33-40. Reference
12. Sundstrom E, Town JP, Rice RW, Osborn DP, Brill M. Office Noise, Satisfaction, and Performance. Environ Behav. 1994;26(2):195-222. Reference
13. Hedge A. The open-plan office: A Systematic Investigation of Employee Reactions to Their Work Environment. Environ Behav. 1982;14(5):519-542. Reference
14. Gensler. What we've learned about focus in the workplace. 2012. Reference
15. Keus van de Poll M, Carlsson J, Marsh JE, et al. Unmasking the effects of masking on performance: The potential of multiple-voice masking in the office environment. J Acoust Soc Am. 2015;138(2):807-816. Reference
16. Engineers TAS of HR and A-C, American Society of Heating Refrigerating and Air-Conditioning Engineers. Chapter 48: Noise and Vibration Control. In: ASHRAE Handbook: HVAC Applications. American Society of Heating Refrigerating and Air-Conditioning Engineers; 2015:1-28. Reference.
17. Jones DM, Miles C, Page J. Disruption of proofreading by irrelevant speech: Effects of attention, arousal or memory? Appl Cogn Psychol. 1990;4(2):89-108. Reference
18. Söderlund GBW, Sikström S, Loftesnes JM, Sonuga-Barke EJ. The effects of background white noise on memory performance in inattentive school children. Behav Brain Funct. 2010;6:1-10. Reference
19. Lercher P, Evans GW, Meis M. Ambient noise and cognitive processes among primary schoolchildren. Environ Behav. 2003;35(6):725-735. Reference
20. Dudarewicz A. The Impact of Low Frequency Noise on Human Mental Performance. Int J Occup Med Env Heal. 2005;18(2):185-199.
21. Cavanaugh WJ, Farrell WR, Hirtle PW, Watters BG. Speech Privacy in Buildings. J Acoust Soc Am. 1962;34(4):475-492. Reference
22. Hornsby BWY. The Speech Intelligibility Index: What is it and what's it good for? Hear J. 2004;57(10):10-17. Reference.
23. Centre for Excellence in Universal Design. Internal environment and services. In: Building for Everyone: A Universal Design Approach. Centre for Excellence in Universal Design. Reference.
24. Hongisto V. A model predicting the effect of speech of varying intelligibility on work performance. Indoor Air. 2005;15(6):458-468. Reference
25. Venetjoki N, Kaarlela-Tuomaala A, Keskinen E, Hongisto V. The effect of speech and speech intelligibility on task performance. Ergonomics. 2006;49(11):1068-1091. Reference
26. Brammer A, Laroche C. Noise and communication: A three-year update. Noise Heal. 2012;14(61):281. Reference
27. Hodsman P. Planning for Psychoacoustics: A Psychological Approach to Resolving Office Noise Distraction. Ecophon, Saint-Gobain. 2015;(April):1-51. Reference
28. Hansell AL, Blangiardo M, Fortunato L, et al. Aircraft noise and cardiovascular disease near Heathrow airport in London: small area study. Bmj. 2013;347:f5432. Reference
29. Klatte M, Bergström K, Lachmann T. Does noise affect learning? A short review on noise effects on cognitive performance in children. Front Psychol. 2013;4(August):1-6. Reference
30. Trimmel K, Schätzer J, Trimmel M. Acoustic noise alters selective attention processes as indicated by direct current (DC) brain potential changes. Int J Environ Res Public Health. 2014;11(10):9938-9953. Reference

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

31. Kaltenbach M, Maschke C, Klinke R. Health Consequences of Aircraft Noise. Dtsch Aerzteblatt Online. 2008;105(31-32):548-556. Reference
32. Solet J, Buxton O, Ellenbogen J, Wang W, Carballiera A. Validating Acoustic Guidelines for Healthcare Facilities: Evidence-based design meets Evidence-based medicine: The Sound Sleep Study. Presented at the: 2010.
33. Goines L, Hagler L. Noise Pollution: A Modern Plague: Adverse Health Effects of Noise. South Med J. 2007;100(3):287-294. Reference
34. General Services Administration, Service PB. PBS-P100 Facilities Standards for the Public Buildings Service. 2016; (March):333. Reference
35. Ceilings & Interior Systems Construction Association. Acoustics in Healthcare Environments. 2010. Reference
36. Pierrette M, Parizet E, Chevret P, Chatillon J. Noise effect on comfort in open-space offices: development of an assessment questionnaire. Ergonomics. 2015;58(1):96-106. Reference
37. Schellenberg EG, Nakata T, Hunter PG, Tamoto S. Exposure to music and cognitive performance: tests of children and adults. Psychol Music. 2007;35(1):5-19. Reference
38. Hodsman P. Planning for Psychoacoustics: A Psychological Approach to Resolving Office Noise Distraction. 2015.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

S01 SOUND MAPPING | P

Intent : Incorporate strategic planning required to prevent issues of acoustic disturbance from various sources of noise.

Summary : This WELL feature requires projects to strategize an acoustical plan that identifies sources of noise that can negatively impact interior spaces.

Issue : Architectural trends, such as open workspaces, lightweight construction and exposed finishes or HVAC foster acoustically uncomfortable environments. [1–4] When noise from internal or external sources is increased in a space, occupants have been found to be easily distracted, less productive and susceptible to burnout.[5–9] In office environments, employees care about privacy and collaboration.[8,10] In one study from the United Kingdom, 99% of employees reported that their concentration was impaired by poor acoustical comfort in the workplace.[7] Similar conditions are reported in workplaces worldwide. [5,8,11–13] Some reports have shown that occupants are less likely to help others under high noise conditions, reducing collaboration in the workplace.[6]

Solutions : To address noise, floor plans should be designed with intent and use in mind.[14] For example, a typical office can be categorized into four key types of programming: spaces for concentration, collaboration, socialization and learning.[15] Location is important, since noise from social or collaborative spaces impacts spaces intended for concentration or learning.[15,16] This approach can be implemented in any space type that incorporates spaces of socialization and recreation alongside areas for task-centric work or learning.[15] These spaces can then be described as loud, quiet and mixed spaces to better assess the impact of sound on sensitive, quiet locations for concentration, learning or recreation.

PART 1 LABEL ACOUSTIC ZONES

For All Spaces:

The project provides the following:

a. A floor plan or other design document showing the following acoustic zones throughout the project:
    1. Loud zone: includes areas intended for loud equipment or activities (e.g., mechanical rooms, AV/IT closets, kitchens, fitness rooms, social spaces, recreational rooms, music rooms).
    2. Quiet zone: includes areas intended for concentration, wellness, rest, study and/or privacy (e.g., restorative spaces, lactation rooms, nap rooms).
    3. Mixed zone: includes areas intended for learning, collaboration and/or presentation (e.g., auditoriums, classrooms, breakout spaces).
    4. Circulation zone: includes occupiable areas not intended for regular occupancy (e.g., hallways, egress, atria, stairs, lobbies)
    5. Not applicable zones: includes other areas without significant sources of sound (e.g., storage rooms, janitor rooms, coat closets) that are not regularly occupied.
b. A plan for reprogramming or mitigating sound transmission between loud zones that border quiet zones (if any).

PART 2 PROVIDE ACOUSTIC DESIGN PLAN

For All Spaces:

The project provides one of the following:

a. A plan developed by the project team and/or project owner that outlines acoustical solutions and a timeline for implementation with a focus on managing acoustical comfort, background noise, speech privacy, reverberation time and/or impact noise within the project boundary.

b. A detailed report from a professional in acoustics that describes existing conditions, recommended solutions and measurement results with a focus on managing background noise, speech privacy, reverberation time and/or impact noise within the project boundary. These measurements are not required to adhere to the Performance Verification Guidebook requirements for on-site testing.

REFERENCES

1. Park SH, Lee PJ, Yang KS, Kim KW. Relationships between non-acoustic factors and subjective reactions to floor impact noise in apartment buildings. J Acoust Soc Am. 2016;139(3):1158-1167. doi:10.1121/1.4944034
2. Oseland N. Psychoacoustics Survey Results. 2015;(September):1-32. http://workplaceunlimited.com/Psychoacoustics Final Report.pdf.
3. Oseland N, Hodsman P. Psychoacoustics Resolving Noise Distractions in the Workplace. In: Hedge A, ed. Ergonomic Workplace Design for Health, Wellness, and Productivity. 1st ed. Routledge; 2016:73-101. https://www.ingentaconnect.com/content/rout/2fbfgk/2017/00000001/00000001/art00005.
4. Hodsman P. Planning for Psychoacoustics: A Psychological Approach to Resolving Office Noise Distraction. 2015.
5. Kaarlela-Tuomaala A, Helenius R, Keskinen E, Hongisto V. Effects of acoustic environment on work in private office rooms and open-plan offices - Longitudinal study during relocation. Ergonomics. 2009;52(11):1423-1444. doi:10.1080/00140130903154579
6. Kim J, de Dear R. Workspace satisfaction: The privacy-communication trade-off inopen-plan offices. J Environ Psychol. 2013;36:18-26. doi:10.1016/j.jenvp.2013.06.007
7. Banbury SP, Berry DC. Office noise and employee concentration: Identifying causes of disruption and potential improvements. Ergonomics. 2005;48(1):25-37. doi:10.1080/00140130412331311390

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

8. Hedge A. The open-plan office: A Systematic Investigation of Employee Reactions to Their Work Environment. Environ Behav. 1982;14(5):519-542. doi:10.1177/0013916582145002
9. Brammer A, Laroche C. Noise and communication: A three-year update. Noise Heal. 2012;14(61):281. doi:10.4103/1463-1741.104894
10. Sailer U, Hassenzahl M. Assessing noise annoyance: An improvement-oriented approach. Ergonomics. 2000;43(11):1920-1938. doi:10.1080/00140130050174545
11. Navai M, Veitch J a. Acoustic Satisfaction in Open-Plan Offices: Review and Recommendations. 2003:23. doi:http://doi.org/10.4224/20386513
12. Frontczak M, Schiavon S, Goins J, Arens E, Zhang H, Wargocki P. Quantitative relationships between occupant satisfaction and satisfaction aspects of indoor environmental quality and building design. Indoor Air. 2012;22(2):119-131. doi:10.1111/j.1600-0668.2011.00745.x
13. Keus van de Poll M, Carlsson J, Marsh JE, et al. Unmasking the effects of masking on performance: The potential of multiple-voice masking in the office environment. J Acoust Soc Am. 2015;138(2):807-816. doi:10.1121/1.4926904
14. General Services Administration, Service PB. PBS-P100 Facilities Standards for the Public Buildings Service. 2016; (March):333. doi:10.1017/CBO9781107415324.004
15. Gensler. What we've learned about focus in the workplace. 2012. https://www.gensler.com/uploads/document/306/file/Focus_in_the_Workplace_10_01_2012.pdf.
16. Moeller N. Placing Sound Masking on the Front Line of Acoustic Design. Construction Canada. https://www.constructioncanada.net/placing-sound-masking-on-the-front-line-of-acoustic-design/. Published 2017. Accessed April 1, 2018.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

S02 MAXIMUM NOISE LEVELS | O (MAX : 3 PT)

Intent : Achieve desired ambient noise levels such that HVAC, exterior noise intrusion or other noise sources do not impact occupant health and well-being.

Summary : This WELL 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.[1–6] 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).[7–11] 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.[12–17] For children, chronic aircraft noise exposure impairs reading comprehension, mental arithmetic and proofreading.[5,18–21]

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.[22] Exterior noise can be controlled by providing sound reduction at the building façade, windows and any exterior penetrations.[23] In both cases, these sound sources are easier to control when considered at the earliest possible stages of design.[24–26]

PART 1 LIMIT BACKGROUND NOISE LEVELS (MAX : 3 PT)

For All Spaces except Dwelling Units & Guest Rooms:

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)

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	Points:
1	Average SPL (Leq)	dBA	55	50	45	40	1
		dBC	75	70	65	60	
	90th percentile SPL (L10)	dBA	65	60	55	50	
2	Average SPL (Leq)	dBA	50	45	40	35	3
		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).[27]

Note :

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

REFERENCES

1. Larsen JB, Vega A, Ribera JE. The Effect of Room Acoustics and Sound-Field Amplification on Word Recognition Performance in Young Adult Listeners in Suboptimal Listening Conditions. Am J Audiol. 2008;17(1):50-59.
2. Jennings MB. Universal Design for Hearing: Considerations for Examining Hearing Demands and Developing

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Hearing Friendly Workplaces. AudiologyOnline. 2009.

3. Cheesman MF, Jennings MB, Klinger L. Assessing communication accessibility in the university classroom: Towards a goal of universal hearing accessibility. Work. 2013;46(2):139-150.
4. Way TJ, Long A, Weihing J, et al. Effect of noise on auditory processing in the operating room. J Am Coll Surg. 2013;216(5):933-938. doi:10.1016/j.jamcollsurg.2012.12.048
5. Weinsteln ND. Effect of Noise on Intellectual Performance. J Appl Psychol. 1974;59(5):548-554. http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=12424317&site=ehost-live&scope=site.
6. Katz JD. Noise in the operating room. Anesthesiology. 2014;121(4):894-898. doi:10.1097/ALN.0000000000000319
7. Jahncke H, Hygge S, Halin N, Green AM, Dimberg K. Open-plan office noise: Cognitive performance and restoration. J Environ Psychol. 2011;31(4):373-382. doi:10.1016/j.jenvp.2011.07.002
8. Evans GW, Johnson D. Stress and open-office noise. J Appl Psychol. 2000;85(5):779-783. doi:10.1037/0021-9010.85.5.779
9. Pierrette M, Parizet E, Chevret P, Chatillon J. Noise effect on comfort in open-space offices: development of an assessment questionnaire. Ergonomics. 2015;58(1):96-106. doi:10.1080/00140139.2014.961972
10. Navai M, Veitch J a. Acoustic Satisfaction in Open-Plan Offices: Review and Recommendations. 2003:23. doi:http://doi.org/10.4224/20386513
11. Banbury S, Berry DC. Habituation and dishabituation to speech and office noise. J Exp Psychol Appl. 1997;3(3):181-195. doi:10.1037/1076-898X.3.3.181
12. Heidemann C, Niemann H, Paprott R, Du Y, Rathmann W, Scheidt-Nave C. Residential traffic and incidence of Type 2 diabetes: the German Health Interview and Examination Surveys. Diabet Med. 2014;31(10):1269-1276. doi:10.1111/dme.12480
13. Sørensen M, Hvidberg M, Andersen ZJ, et al. Road traffic noise and stroke: A prospective cohort study. Eur Heart J. 2011;32(6):737-744. doi:10.1093/eurheartj/ehq466
14. Niemann H, Bonnefoy X, Braubach M, et al. Noise-induced annoyance and morbidity results from the pan-European LARES study. Noise Heal. 2006;8(31):63. doi:10.4103/1463-1741.33537
15. Babisch W, Beule B, Schust M, Kersten N, Ising H. Traffic noise and risk of myocardial infarction. Epidemiology. 2005;16(1):33-40. doi:10.1097/01.ede.0000147104.84424.24
16. Jarup L, Babisch W, Houthuijs D, et al. Hypertension and exposure to noise near airports: The HYENA study. Environ Health Perspect. 2008;116(3):329-333. doi:10.1289/ehp.10775
17. Chang TY, Lai YA, Hsieh HH, Lai JS, Liu CS. Effects of environmental noise exposure on ambulatory blood pressure in young adults. Environ Res. 2009;109(7):900-905. doi:10.1016/j.envres.2009.05.008
18. Bronzaft AL, Mccarthy DP. The effect of elevated train noise on reading ability. Environ Behav. 1975;7(4):517-528. doi:10.1177/001391657500700406
19. Hygge S, Evans GW, Bullinger M. A prospective study of some effects of aircraft noise on cognitive performance in schoolchildren. Psychol Sci. 2002;13(5):469-474. doi:10.1111/1467-9280.00483
20. HAINES MM, STANSFELD SA, JOB RFS, BERGLUND B, HEAD J. Chronic aircraft noise exposure, stress responses, mental health and cognitive performance in school children. Psychol Med. 2001;31(02):265-277. doi:10.1017/S0033291701003282
21. Belojević G, Öhrström E, Rylander R. Effects of noise on mental performance with regard to subjective noise sensitivity. Int Arch Occup Environ Health. 1992;64(4):293-301. doi:10.1007/BF00378288
22. Engineers TAS of HR and A-C, American Society of Heating Refrigerating and Air-Conditioning Engineers. Chapter 48: Noise and Vibration Control. In: ASHRAE Handbook: HVAC Applications. American Society of Heating Refrigerating and Air-Conditioning Engineers; 2015:1-28. https://www.ashrae.org/technical-resources/ashrae-handbook/description-2015-ashrae-handbook-hvac-applications.
23. The EP, Dep TNYC, York N. Noise Control for Building Exterior Heating , Ventilation and Air Conditioning Equipment Guidance Sheet. 2013:1-4.
24. Service GPB. Sound Matters. 2012;(January):1-42.
25. General Services Administration. Sound Matters: How to Achieve Acoustic Comfort in the Contemporary Office. 2011. https://www.wbdg.org/FFC/GSA/gsa_soundmatters.pdf.
26. Hodsman P. Planning for Psychoacoustics: A Psychological Approach to Resolving Office Noise Distraction. 2015.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

27. Joseph WS. Night noise guidelines for Europe. J Am Podiatr Med Assoc. 2009;100(5):1-162. doi:10.1093/ejechocard/jer095

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

S03 SOUND BARRIERS | O (MAX : 3 PT)

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

Summary : This WELL feature requires that walls and doors 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 or doors can be distracting or annoying and also disturb sleep. [1–5] There is evidence that links noise annoyance in multi-story housing to poor mental health and perceived stress in residents.[6,7] 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).[1,8] 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.[9–11]

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. Doors also reduce performance of walls but can be fitted with gaskets and seals to reduce sound transmission, when the door is closed. Rooms that require high speech privacy can use sound masking systems, in addition to high-performing walls to increase privacy.[8]

PART 1 DESIGN FOR SOUND ISOLATION AT WALLS AND DOORS (MAX : 1 PT)

For All Spaces:

The following requirements are met:

a. Interior walls meet the following sound transmission class (STC) or weighted sound reduction (Rw) values. If an interior wall meets multiple categories listed, use the highest (i.e., more stringent) STC/Rw value listed.

Interior Wall Type	Minimum STC or Rw	OR	Minimum STC or Rw for Projects That Achieve Feature S06.1
Between loud zones and regularly occupied spaces.	60	OR	60
Between areas for conferencing, learning or sleeping and other regularly occupied spaces.	55	OR	50
Between adjacent quiet zones.	50	OR	45
Between rooms for concentration and other regularly occupied spaces.	45	OR	40
Between circulation zones and regularly occupied spaces.	40	OR	35

b. Doors that connect two occupiable rooms and doors to mechanical equipment rooms have a non-hollow core, minimum STC/Rw of 30 and seals at the head, jamb and base.

PART 2 ACHIEVE SOUND ISOLATION AT WALLS (MAX : 2 PT)

For All Spaces:

Option 1: Noise isolation class

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

a. The project meets 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	OR	Minimum NIC or Dw for Projects That Achieve Feature S06.1
Between loud zones and regularly occupied spaces.	55	OR	N/A
Between areas for conferencing, learning or sleep and other regularly occupied spaces.	50	OR	45
Between adjacent quiet zones.	45	OR	40
Between rooms for concentration and other regularly occupied spaces.	40	OR	35
Between circulation zones and regularly occupied spaces.	35	OR	30

OR

Option 2: Speech privacy

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.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

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
Enclosed quiet zones	Open areas for concentration Circulation zones	70
	Enclosed quiet zones	75
	Enclosed areas for conferencing Enclosed areas for learning Enclosed areas for sleeping	80

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

REFERENCES

1. Hongisto V, Oliva D, Keränen J. Subjective and objective rating of airborne sound insulation - living sounds. Acta Acust united with Acust. 2014;100(5):848-863. doi:10.3813/AAA.918765
2. Park HK, Bradley JS, Grover BN. Rating Airborne Sound Insulation in Terms of the Annoyance and Loudness of Transmitted Speech and Music Sounds.; 2008.
3. 3Xie H, Kang J, Mills GH. Clinical review: The impact of noise on patients' sleep and the effectiveness of noise reduction strategies in intensive care units. Crit Care. 2009;13(2):208. doi:10.1186/cc7154
4. Strauch C, Brandt S, Edwards-Beckett J. Implementation of a quiet hour: effect on noise levels and infant sleep states. Neonatal Netw. 1993;12(2):31-35.
5. Parthasarathy S, Tobin MJ. Sleep in the intensive care unit. Instensive Care Med. 2004;30:197-206.
6. Jensen HAR, Rasmussen B, Ekholm O. Neighbour noise annoyance is associated with various mental and physical health symptoms: results from a nationwide study among individuals living in multi-storey housing. BMC Public Health. 2019;19(1):1508. doi:10.1186/s12889-019-7893-8
7. Jeon JY, Ryu JK, Lee PJ. A quantification model of overall dissatisfaction with indoor noise environment in residential buildings. Appl Acoust. 2010;71(10):914-921. doi:10.1016/j.apacoust.2010.06.001
8. Hongisto V, Varjo J, Leppämäki H, Oliva D, Hyönä J. Work performance in private office rooms: The effects of sound insulation and sound masking. Build Environ. 2016;104(1):263-274. doi:10.1016/j.buildenv.2016.04.022
9. Trevathan JW, Pearse JR. The effect of workmanship on the transmission of airborne sound through light framed walls. Appl Acoust. 2008;69(2):127-131.
10. Craik RJM, Steel JA. The effect of workmanship on sound transmission through buildings: Part 1 - Airborne sound. Appl Acoust. 1989;27(1):57-63.
11. Craik RJM. The consequences of lightweight buildings on sound transmission. Build Serv Eng Res Technol. 1998;19(1):B1-B4.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

S04 REVERBERATION TIME | O (MAX : 2 PT)

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

Summary : This WELL 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 and unamplified speech). Studies have shown that high reverberation times in classrooms increase auditory workload in students and reduce cognition, memory retention and concentration.[1–4] Similarly, studies have shown that high reverberation reduces speech intelligibility among hard of hearing and non-native speaking populations.[5–8]

Solutions : Reverberation time can be controlled by adding absorptive surface finishes at ceilings, walls and furniture.[9–11] 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.[5,12–14]

PART 1 ACHIEVE REVERBERATION TIME THRESHOLDS (MAX : 2 PT)

For All Spaces except Dwelling Units & Guest Rooms:

Option 1: Reverberation time, design

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 feet)	Reverberation Time, t (seconds)[5,9,10]
Areas for learning Areas for lectures Areas for conferencing	$v < 10{,}000\ ft^3$	$t \leq 0.6$
	$10{,}000\ ft^3 \leq v \leq 20{,}000\ ft^3$	$t \leq 0.8$
	$v > 20{,}000\ ft^3$	$t \leq 1.0$
Areas with regularly used PA systems	N/A	$t \leq 1.5$
Areas for dining	N/A	$t \leq 1.0$
Areas for fitness	$v < 10{,}000\ ft^3$	$t \leq 0.8$
	$10{,}000\ ft^3 \leq v \leq 20{,}000\ ft^3$	$t \leq 1.1$
	$v > 20{,}000\ ft^3$	$t \leq 1.8$
Areas for music rehearsal	$v < 10{,}000\ ft^3$	$t \leq 1.1$
	$10{,}000\ ft^3 \leq v \leq 20{,}000\ ft^3$	$t \leq 1.4$

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

OR

Option 2: Reverberation time, performance

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 feet)	Reverberation Time, t (seconds)[5,9,10]
Areas for learning Areas for lectures Areas for conferencing	$v < 10{,}000\ ft^3$	$t \leq 0.6$
	$10{,}000\ ft^3 \leq v \leq 20{,}000\ ft^3$	$t \leq 0.8$
	$v > 20{,}000\ ft^3$	$t \leq 1.0$
Areas with regularly used PA systems	N/A	$t \leq 1.5$
Areas for dining	N/A	$t \leq 1.0$
	$v < 10{,}000\ ft^3$	$t \leq 0.8$

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Areas for fitness	10,000 ft^3 ≤ v ≤ 20,000 ft^3	t ≤ 1.1
	v > 20,000 ft^3	t ≤ 1.8
Areas for music rehearsal	v < 10,000 ft^3	t ≤ 1.1
	10,000 ft^3 ≤ v ≤ 20,000 ft^3	t ≤ 1.4

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.

REFERENCES

1. Klatte M, Bergström K, Lachmann T. Does noise affect learning? A short review on noise effects on cognitive performance in children. Front Psychol. 2013;4(August):1-6. doi:10.3389/fpsyg.2013.00578
2. Klatte M, Hellbrück J, Seidel J, Leistner P. Effects of Classroom Acoustics on Performance and Well-Being in Elementary School Children: A Field Study. Environ Behav. 2010;42(5):659-692. doi:10.1177/0013916509336813
3. Venetjoki N, Kaarlela-Tuomaala A, Keskinen E, Hongisto V. The effect of speech and speech intelligibility on task performance. Ergonomics. 2006;49(11):1068-1091. doi:10.1080/00140130600679142
4. Belojević G, Öhrström E, Rylander R. Effects of noise on mental performance with regard to subjective noise sensitivity. Int Arch Occup Environ Health. 1992;64(4):293-301. doi:10.1007/BF00378288
5. Ihrig W, The National Academies of Sciences Engineering Medicine, Transportation Research Board. Improving Intelligibility of Airport Terminal Public Address Systems. 2017. doi:10.17226/24839
6. Heylighen A, Rychtarikova M, Vermeir G. Designing Spaces for Every Listener. Univers Access Inf Soc. 2010;9(3):283-292.
7. The National Disability Authority's Centre for Excellence in Universal Design. Building for Everyone: A universal design approach. 2012:4-106.
8. Centre for Excellence in Universal Design. Internal environment and services. In: Building for Everyone: A Universal Design Approach. Centre for Excellence in Universal Design. http://universaldesign.ie/Built-Environment/Building-for-Everyone/.
9. Architectural Joint Technical Committee AV-004 Acoustical. AS/NZS 2107:2016. 2016:24.
10. General Services Administration. Sound Matters: How to Achieve Acoustic Comfort in the Contemporary Office. 2011. https://www.wbdg.org/FFC/GSA/gsa_soundmatters.pdf.
11. General Services Administration, Service PB. PBS-P100 Facilities Standards for the Public Buildings Service. 2016; (March):333. doi:10.1017/CBO9781107415324.004
12. ANSI/INFOCOMM. ANSI/INFOCOMM 10:2013 Audiovisual Systems Performance Verification. 2013.
13. InfoComm International. AV / IT Infrastructure Guidelines for Higher Education.
14. Publication BSIS. BSI Standards Publication - Sound system equipment - Part 4. 2011.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

S05 SOUND REDUCING SURFACES | O (MAX : 2 PT)

Intent : Design spaces with sound reducing surfaces to minimize the buildup of speech or other unwanted sound.

Summary : This WELL feature requires the use of acoustic materials that absorb and/or block sound to support concentration and reduce reverberation.

Issue : Increases in reverberation are commonly caused by lack of acoustical absorption.[1] When spaces are designed with hard reflective ceilings and walls, perception of noise increases with an increase in ambient, reflected noise that decays in level at a longer rate.[2,3] When open collaborative spaces lack acoustical absorption at ceilings or partial height barriers, workers can become distracted by reflected sound, especially if that speech is perceptible.[3–6] Conversely, in learning environments, reverberation can impair a listener's comprehension of speech due to poor speech intelligibility, especially when listeners are hard of hearing, expending a greater auditory workload to process speech resulting in reduced task performance.[7–12] In rooms where teleconferencing or audio equipment introduces amplified sound, spaces without adequate acoustical treatment are subject to higher functioning background noise levels, which may be heard in neighboring spaces.[1,13–15] Lack of reflected sound control in spaces for conferencing can impact the quality of speech intelligibility over teleconferencing equipment.

Solutions : Providing acoustical treatment that significantly reduces sound across human speech frequencies can greatly reduce unwanted buildup of reflected sound.[1] Ceilings typically provide the greatest area of coverage where highly absorptive materials can offer the best performance in reducing reverberation and controlling speech intelligibility and occupied noise levels.[3,16,17] Wall treatment can reduce reflections that impact performance of speech intelligibility with teleconferencing equipment.[1]

PART 1 IMPLEMENT SOUND REDUCING SURFACES (MAX : 2 PT)

For All Spaces except Dwelling Units:

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. Acoustical furnishings meet the criteria shown in the following table:

Room Type	Metric	Tier 1 1 Point	Tier 2 2 Points
Open workspaces	Minimum NRC OR Alpha-w	0.75 for at least 75% of available ceiling area	0.90 for all available ceiling area[1,18]
	Minimum furniture height and NRC OR Alpha-w	N/A	Partial height barriers with a minimum height of 4 ft above finished floor and a minimum NRC OR Alpha-w value of 0.70 between all opposing workstations[1]
Areas for conferencing and learning	Minimum NRC OR Alpha-w at ceilings	0.75 for at least 50% of available ceiling area	0.90 for all available ceiling area
	Minimum NRC OR Alpha-w at walls	0.75 on at least 25% of one wall	0.80 on at least 25% of two perpendicular walls
Areas for dining	Minimum NRC OR Alpha-w at ceilings	0.75 on at least 50% of available ceiling area	0.90 for all available ceiling area

REFERENCES

1. General Services Administration. Sound Matters: How to Achieve Acoustic Comfort in the Contemporary Office. 2011. https://www.wbdg.org/FFC/GSA/gsa_soundmatters.pdf.
2. Bradley. Speech Intelligibility Studies in Classrooms. J Acoust Soc Am. 1986.
3. Bradley JS. The acoustical design of conventional open plan offices. Can Acoust. 2003;27(3):23-31. doi:NRCC-46274 A
4. Venetjoki N, Kaarlela-Tuomaala A, Keskinen E, Hongisto V. The effect of speech and speech intelligibility on task performance. Ergonomics. 2006;49(11):1068-1091. doi:10.1080/00140130600679142
5. Jensen KL, Arens E, Zagreus L. Acoustical Quality in Office Workstations , As Assessed By Occupant Surveys. Indoor Air 10th Int Conf indoor air Qual Clim. 2005:2401-2405. doi:10.1111/j.1600-0668.2011.00745.x
6. Kim J, de Dear R. Workspace satisfaction: The privacy-communication trade-off inopen-plan offices. J Environ Psychol. 2013;36:18-26. doi:10.1016/j.jenvp.2013.06.007
7. Klatte M, Hellbrück J, Seidel J, Leistner P. Effects of Classroom Acoustics on Performance and Well-Being in Elementary School Children: A Field Study. Environ Behav. 2010;42(5):659-692. doi:10.1177/0013916509336813
8. Bennetts L, Flynn M. Improving the classroom listening skills of children with Down syndrome by using sound-field amplification. Downs Syndr Res Pract. 2002;8(1):19-24.
9. Bradley JS. Speech intelligibility studies in classrooms. J Acoust Soc Am. 1986;80(3).

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

10. Cheesman MF, Jennings MB, Klinger L. Assessing communication accessibility in the university classroom: Towards a goal of universal hearing accessibility. Work. 2013;46(2):139-150.
11. Bradley JS. Speech intelligibility studies in classrooms Speech intelligibility. 2009;846(1986). doi:10.1121/1.393908
12. Peters LJ. Auditory Performance: A Model to Predict Task Performance as a Function of Auditory Workload: Overview. In: Proceedings of the Human Factors and Ergonomics Society Annual Meeting. ; 1991.
13. InfoComm International. AV / IT Infrastructure Guidelines for Higher Education.
14. Larsen JB, Vega A, Ribera JE. The Effect of Room Acoustics and Sound-Field Amplification on Word Recognition Performance in Young Adult Listeners in Suboptimal Listening Conditions. Am J Audiol. 2008;17(1):50-59.
15. Watson A, Sasse MA. Measuring Perceived Quality of Speech and Video in Multimedia Conferencing Applications. :1-6.
16. Pierrette M, Parizet E, Chevret P, Chatillon J. Noise effect on comfort in open-space offices: development of an assessment questionnaire. Ergonomics. 2015;58(1):96-106. doi:10.1080/00140139.2014.961972
17. Larm P, Keränen J, Helenius R, Hakala J, Hongisto V. Acoustics in open-plan offices -- A laboratory study. Forum Acusticum. 2005;(Figure 1):2021-2025.
18. Veitch JA, Bradley JS, Legault LM, Norcross SG, Svec JM. IRC-IR-846: Masking speech in open-plan offices with simulated ventilation noise: Noise level and spectral composition effects on acoustic satisfaction. 2002; (November):1-56.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

S06 MINIMUM BACKGROUND SOUND | O (MAX : 2 PT)

Intent : Increase acoustical privacy within and between occupied spaces.

Summary : This WELL feature requires the use of dedicated artificial sound to uniformly increase speech privacy between occupied spaces.

Issue : Speech privacy can be described as the signal-to-noise ratio, or sound blocking and sound cover, of perceptible speech reaching a listener. [1] Ambient background sound, which can include artificial sound sources, can increase speech privacy to comfortable levels.[2,3] However, ambient background noise provided by HVAC systems alone is shown to fluctuate by zone and by as much as 15 dBA or more in a given year.[4] Some HVAC systems, like chilled beams, offer little to no ambient sound contribution and result in quiet interiors, where speech is readily intelligible and distracting. In offices and patient rooms where speech privacy is critical between regularly occupied spaces, a combination of reliable background sound is needed where partitions do not perform above a minimum STC-30.[5]

Solutions : Consistent background sound can be delivered to a space using an adjustable array of loudspeakers located such that sound is uniformly distributed. [6,7] These systems are programmed to output a sound source similar to the sound of air flowing through HVAC. The sound source is broad-band and designed to elevate ambient background sound level to improve the signal-to-noise ratio and reduce speech perception between enclosed and open environments.[8,9]

PART 1 PROVIDE MINIMUM BACKGROUND SOUND (MAX : 1 PT)

For Office Spaces:

The following requirements are met:

a. A sound masking system is installed in open areas and enclosed rooms designated as quiet zones, circulation zones and in areas where workstations are present.

b. The sound masking system produces a 1/3 octave band adjustable output signal and minimum frequency spectrum of 100 Hz to 5 kHz.

c. The sound masking system is commissioned such that the following sound pressure levels are not exceeded:

   1. Open areas designated as quiet zones, circulation zones and areas where workstations are present: 48 dBA.
   2. Enclosed rooms labeled as quiet zones: 42 dBA.

d. The sound masking system is verified by a professional sound masking system installer in accordance with ASTM 1573-18 or equivalent standard.

PART 2 PROVIDE ENHANCED SPEECH REDUCTION (MAX : 1 PT)

For All Spaces:

The project achieves the following features and parts:

a. Achieve two points in either Feature S03 Part 2 - Achieve Sound Isolation at Walls or Feature S05 Part 1 – Implement Sound Reducing Surfaces.

b. Feature S06 Part 1 – Provide Minimum Background Sound.

REFERENCES

1. Venetjoki N, Kaarlela-Tuomaala A, Keskinen E, Hongisto V. The effect of speech and speech intelligibility on task performance. Ergonomics. 2006;49(11):1068-1091. doi:10.1080/00140130600679142
2. Hongisto V. Effects of sound masking on workers - a case study in a landscaped office. 9th Int Congr Noise as a Public Heal Probl. 2008;(1979):1-8.
3. Larm P, Keränen J, Helenius R, Hakala J, Hongisto V. Acoustics in open-plan offices -- A laboratory study. Forum Acusticum. 2005;(Figure 1):2021-2025.
4. Hongisto V. Effect of sound masking on workers in an open office. Acoust 08 Paris. 2008;June 29-Ju(1979):537-542. doi:10.1121/1.2932454
5. Hongisto V, Oliva D, Keränen J. Subjective and objective rating of airborne sound insulation - living sounds. Acta Acust united with Acust. 2014;100(5):848-863. doi:10.3813/AAA.918765
6. Bradley JS. The acoustical design of conventional open plan offices. Can Acoust. 2003;27(3):23-31. doi:NRCC-46274 A
7. Veitch JA, Bradley JS, Legault LM, Norcross SG, Svec JM. IRC-IR-846: Masking speech in open-plan offices with simulated ventilation noise: Noise level and spectral composition effects on acoustic satisfaction. 2002;(November):1-56.
8. DeLoach AG, Carter JP, Braasch J. Tuning the cognitive environment: Sound masking with "natural" sounds in open-plan offices. J Acoust Soc Am. 2015;137(4):2291-2291. doi:10.1121/1.4920363
9. Alvarsson JJ, Wiens S, Nilsson ME. Stress recovery during exposure to nature sound and environmental noise. Int J Environ Res Public Health. 2010;7(3):1036-1046. doi:10.3390/ijerph7031036

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

S07 B IMPACT NOISE MANAGEMENT | O (MAX : 3 PT)

Intent : Reduce the level of impact noise radiation by designing resilient floors.

Summary : This WELL 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.[1] Impact noise typically derives from objects impacting a floor (e.g., footfall, machinery, gym equipment) and can result in workplace distractions, sleep disturbance or disrupted focus.[2,3]

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.[4–7] 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. The performance of floor-ceiling materials can be measured using the following metrics: Impact Insulation Class Rating (IIC), Normalized Impact Sound Rating (NISR) or Weighted Standardized Impact Sound Pressure Level (L_{nTw}).

PART 1 SPECIFY IMPACT NOISE REDUCING FLOORING (MAX : 1 PT)

For All Spaces:

The following requirements are met:

a. For the following room types within the project boundary the floor-ceiling construction achieves the following minimum Impact Insulation Class (IIC) ratings with materials tested in accordance with ASTM E492-09, ISO 717.2 or predicted results determined through use of sound transmission modeling software (L_{nTw} may be used as an equivalent metric and values may be determined by subtracting the IIC values listed below from 110):

Room Type	Location of Applicable Floor-Ceiling Assembly	Minimum Impact Insulation Class (IIC)[103]
Quiet zones (except areas for concentration)	Above	55
Areas for fitness	Below	50
Enclosed areas for concentration and conferencing	Above	50
Open areas for concentration	Above	45
Areas for retail and dining	Below	45

Note :

This requirement does not apply to floor/ceiling assemblies that separate a relevant room type from a parking garage or non-occupiable space (e.g., a quiet zone that is vertically adjacent to a roof, equipment room or attic).

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 2 MEET THRESHOLDS FOR IMPACT NOISE RATING (MAX : 2 PT)

For All Spaces:

The following requirements are 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 (L_{nTw} 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[1]	Tier 2 2 points Minimum NISR[1]
Quiet zones (except areas for concentration)	Above	52	57
Areas for Fitness (If space is within the project boundary)	Below	47	52
Enclosed Areas for Concentration and Conferencing	Above	47	52

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Open Areas for Concentration	Above	42	47
Areas for Retail and Dining (If space is within the project boundary)	Below	42	47

Note :
This requirement does not apply to floor/ceiling assemblies that separate a relevant room type from a non-occupiable space (e.g., a quiet zone that is vertically adjacent to a roof, equipment room or attic).

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. LoVerde J, Miller E, Nash AP, et al. ICC G2-2010 Guideline for Acoustics. 2010:29.
2. Joen J, Lee P, Kim P, Yoo S. Subjective evaluation of heavy-weight floor impact sounds in relation to spatial characteristics. J Acoust Soc Am. 2009;125(5):2987-2994.
3. Ljunggren, Fredrik; Simmons, Christian; Hagberg K. Correlation between sound insulation and occupants' perception – Proposal of alternative single number rating of impact sound. Appl Acoust. 2014;85:57-68.
4. Blazier JWE, DuPree RB. Investigation of low-frequency footfall noise in wood-frame, multifamily building construction. J Acoust Soc Am. 1994;96:1521-1532.
5. Ryu J, Sato H, Kurakata K, Hiramitsu A, Tanaka M, Hirota T. Relation between annoyance and single-number quantities for rating heavy-weight floor impact sound insulation in wooden houses. J Acoust Soc Am. 2011;129(5):3047-3055. doi:10.1121/1.3561660
6. Structural Building Components Association. Sound Transmission in Wood Floor and Roof Trusses.; 2016.
7. Rindel J. The relationship between sound insulation and acoustic quality in dwellings. In: Inter-Noise 98. ; 1998.
8. Understanding IIC & STC Sound Testing.
9. Warnock ACC. Controlling the Transmission of Impact Sound through Floors. NRC Constr Technol Updat No 25. 1999.
10. International Code Council. International Building Code.; 2015.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

S08 ENHANCED AUDIO DEVICES | O (MAX : 2 PT)

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

Summary : This WELL feature requires projects to implement organizational policies and provide occupants with devices that support enhanced speech intelligibility and bolster hearing 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 neurodiversity.[1–9] Audio equipment used for communication can further decrease comprehension of spoken word when installed and used incorrectly.[1,5,10–13] Additionally, increased auditory workload can impact task performance, resulting in a higher risk of misunderstanding, operational errors and accidents.[14] 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.[15–20] 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.[21]

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.[22,23] To provide the best possible outcomes for users, systems should be commissioned by a professional in audio engineering to effectively meet occupant needs and support a range of user experiences.[24–26]

PART 1 PROVIDE ENHANCED SPEECH INTELLIGIBILITY (MAX : 1 PT)

For All Spaces:

The project meets the following requirements, as applicable:

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.[27]
   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 and as indicated in a commissioning report, acoustical model or similar.[28]

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

   1. Designed to meet audio distribution requirements in accordance with ANSI/ASA S12.60 Part 1.[29,30]
   2. Commissioned by a professional acoustician or audio engineer in accordance with ANSI/INFOCOMM A102.01:2017 or equivalent.

PART 2 PRIORITIZE AUDIO DEVICES AND POLICIES (MAX : 1 PT)

For All Spaces:

The project or organization supports individual acoustical needs through policies that meet at least three of the following requirements:

a. All employer-provided audio devices are managed internally by a qualified professional (e.g., IT professional, mobile device manager) and expectations for use are covered in the employee handbook and/or during on-boarding of new staff.[31,32]

b. Eligible employees can request alternative working arrangements to accommodate their individual acoustic comfort needs (e.g., option to work remotely, different workstation location).[33,34]

c. Signage is used to indicate both the location and intended activities of the quiet and mixed zones. A minimum of one daily quiet hour is scheduled.[35]

d. Eligible employees and distance learners (as applicable) are provided speech-enhancing audio devices (e.g., headsets with active digital signal processing, or noise-cancellation) upon request and at no additional cost or subsidized at least 50%.[36]

REFERENCES

1. Crandell CC. Effects of Sound Field FM Amplification on the Speech Perception of ESL Children.pdf.
2. Edwards C, Harold G. DeafSpace and the principles of universal design. Disabil Rehabil. 2014;36(16):1350-1359.
3. Hintermair M. Health-Related Quality of Life and Classroom Participation of Deaf and Hard-of-Hearing Students in General Schools. 2010. doi:10.1093/deafed/enq045
4. Klatte M, Hellbrück J, Seidel J, Leistner P. Effects of Classroom Acoustics on Performance and Well-Being in Elementary School Children: A Field Study. Environ Behav. 2010;42(5):659-692. doi:10.1177/0013916509336813
5. Bennetts L, Flynn M. Improving the classroom listening skills of children with Down syndrome by using sound-field amplification. Downs Syndr Res Pract. 2002;8(1):19-24.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

6. Jennings MB. Universal Design for Hearing: Considerations for Examining Hearing Demands and Developing Hearing Friendly Workplaces. AudiologyOnline. 2009.
7. Cheesman MF, Jennings MB, Klinger L. Assessing communication accessibility in the university classroom: Towards a goal of universal hearing accessibility. Work. 2013;46(2):139-150.
8. Heylighen A, Rychtarikova M, Vermeir G. Designing Spaces for Every Listener. Univers Access Inf Soc. 2010;9(3):283-292.
9. Renel W. Sonic Accessibility: Increasing Social Equity Through the Inclusive Design of Sound in Museums and Heritage Sites. Curator Museum J. 2019;62(3):377-402.
10. Larsen JB, Vega A, Ribera JE. The Effect of Room Acoustics and Sound-Field Amplification on Word Recognition Performance in Young Adult Listeners in Suboptimal Listening Conditions. Am J Audiol. 2008;17(1):50-59.
11. Neel AT. Effects of Loud and Amplified Speech on Sentence and Word Intelligibility in Parkinson Disease. J Speech, Lang Hear Res. 2009;52(4):1021-1033.
12. Arnold P, Canning D. Does classroom amplification aid comprehension? Br J Audiol. 1999;33(3):171-178.
13. Elliott L, Hammer M, Scholl M. Fine-grained auditory discrimination in normal children and children with language-learning problems. J Speech Hear Res. 1989;32(1):112-119.
14. Peters LJ. Auditory Performance: A Model to Predict Task Performance as a Function of Auditory Workload: Overview. In: Proceedings of the Human Factors and Ergonomics Society Annual Meeting. ; 1991.
15. Dissertation A. The Voice An Occupational Tool A Study of Theacher´s Classroom Speech and the Effects of Amplification. 2003.
16. AM de M, SM B, AA A. Voice disorders (dysphonia) in public school female teachers working in Belo Horizonte: prevalence and associated factors. J Voice. 2008;22(6):676-687.
17. Chen S, Chiang S, YM C, Hsiao L, Hsiao T. Risk factors and effects of voice problems for teachers. J Voice. 2010;24(2):183-190.
18. Rocha L da, Bach S de L, Amaral P do, Behlau M, Souza L de M. Risk Factors for the Incidence of Perceived Voice Disorders in Elementary and Middle School Teachers. J Voice. 2017;31(2).
19. YR L, HR K, Lee S. Effect of teacher's working conditions on voice disorder in Korea: a nationwide survey. Ann Occup Env Med. 2018;30(43).
20. Moy F, Hoe V, Hairi N, Chu A, Bulgiba A, Koh D. Determinants and Effects of Voice Disorders among Secondary School Teachers in Peninsular Malaysia Using a Validated Malay Version of VHI-10. PLoS One. 2015;10(11).
21. Flexer C. The Impact of Classroom Acoustics: Listening, Learning, and Literacy. Semin Hear. 2004;25(2):131-140.
22. Wainhouse Research. The Impact of Broadcast and Streaming Video in Education. 2012.
23. Fukushima M, Nakamura N, Yanagawa H. Evaluation of speech intelligibility for classroom-to-classroom collaborative leaning via multimedia network. 1(1):1-5.
24. InfoComm International. AV / IT Infrastructure Guidelines for Higher Education.
25. ANSI/INFOCOMM. ANSI/INFOCOMM 10:2013 Audiovisual Systems Performance Verification. 2017:30.
26. Downs DW, Crum MA. Processing Demands During Auditory Learning Under Degraded Listening Conditions. J Speech Hear Res. 1978;21(4):702-714.
27. Alarm NF, Code S, Fire N, et al. National Fire Alarm and Signaling Code. 2014:1-351.
28. International Electrotechnical Commission. IEC 60268-16 - Sound System Equipment - Part 16: Objective Rating of Speech Intelligibility by Speech Transmission Index. 2011:76.
29. Accredited Standards Committee S12 Noise. ANSI/ASA S12.60-2010/Part 1 American National standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools. 2010:30. doi:10.1063/1.3056837
30. Mullins T, Boeshans B, Colquhoun J, Graham A, Kruse K. ANSI/INFOCOMM A102.01:2017 - Audio Coverage Uniformity in Listener Areas. 2017:30. https://www.infocomm.org/cps/rde/xchg/infocomm/hs.xsl/32930.htm.
31. Ghosh A, Gajar PK, Rai S. Bring your own device (BYOD): Security risks and mitigating strategies. J Glob Res Comput Sci. 2013;4(4):62-70.
32. Ernst and Young. Bring Your Own Device: Security and risk considerations for your mobile device program. 2013; (September):1-16.
33. Dixon M. The IWG Global Workspace Survey: Welcome to Generation Flex - The Employee Power Shift. 2019;

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

(March):1-27.

34. Oseland N, Webber C. Flexible Working Benefits: Collated Evidence and Case Studies. 2012;(September):1-14.
35. König CJ, Kleinmann M, Höhmann W. A field test of the quiet hour as a time management technique. Rev Eur Psychol Appl. 2013;63(3):137-145. doi:10.1016/j.erap.2012.12.003
36. Frost & Sullivan. The Smartphone Productivity Effect : Quantifying the Productivity Gains of Smartphones in the Enterprise. 2016:1-19.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

S09 B HEARING HEALTH CONSERVATION | O (MAX : 1 PT)

Intent : Increase access to resources and structured programming for employees who are at risk of occupational hearing loss.

Summary : This WELL feature requires projects or organizations to implement policies and programs that support hearing health conservation.

Issue : The World Health Organization reports that approximately 466 million people worldwide have disabling hearing loss, of which 34 million are children. [1] Estimates suggest that by the year 2050 over 900 million people will have disabling hearing loss.[1] Typical environments where hazardous sound levels can occur include occupational settings where loud equipment is present (e.g., industrial spaces, airports, fitness studios), as well as settings where occupants regularly engage with personal listening devices (PLDs) that exceed safe listening levels (e.g., call centers, distance learning, recreational devices). Presbycusis, also known as age-related hearing loss, comprises most hearing loss cases.[2–4] Studies have shown that individuals with hearing loss over the age of 65 are at higher risk to develop cognitive disorders like dementia and Alzheimer's disease.[2,5,6] In all forms, hearing loss can lead to exclusion from communication and may impact social and emotional health by leading to feelings of loneliness, isolation and frustration, particularly among older populations.[7] The annual economic impact of hearing loss is an estimated US $750 billion, which accounts for costs related to healthcare (excluding the cost of hearing devices), educational support and loss of productivity and well-being.[8]

Solutions : Hearing health conservation programs that raise awareness about the risks of hearing loss and encourage individuals to use personal protective devices (e.g., earplugs, earmuffs) may help prevent noise induced hearing loss.[9,10] Organization-wide programs that focus on the reduction of occupational noise exposure, provide access to regular hearing health screenings for vulnerable occupants and provide relevant staff with necessary training for use of loud equipment have been found to help limit disabling hearing impairments, reduce fatigue and in some cases improve morale and work efficiency.[9] Companies that deploy these programs have reported reductions in medical expenses and worker compensation costs.[11–13]

PART 1 IMPLEMENT A HEARING HEALTH CONSERVATION PROGRAM (MAX : 1 PT)

For All Spaces:

1: Hearing health conservation program

The project maintains a hearing health conservation program that meets the following requirements:

a. Provides hearing protection that is selected, fitted and maintained for all occupants at no cost to the occupant.[14]

b. Demonstrates compliance with OSHA Code of Federal Regulations Title 29 Chapter XVII Part 1910 Subpart G, European Council Directive 89/391/CEE or equivalent.[15–17]

c. Audiogram tests are made available to employees working in loud zones, at no cost in a room that meets ANSI S3.1-2018 (or equivalent) requirements for background noise levels, using calibrated audiometers as per the schedule below:

   1. Annually for all employees.[9]
   2. Pre-employment or during onboarding for all new employees.[9]
   3. Prior to initial assignment in a hearing-hazardous zone as determined by the hearing conservation program supervisor (see below).[9]
   4. At the time of reassignment out of a hearing-hazardous work area or job, as determined by the hearing conservation program supervisor (see below).[9]
   5. At the conclusion of employment.[9]

2: Hearing health conservation supervisor

The project designates a qualified hearing health supervisor whose responsibilities include the following:

a. Coordinates at least one hearing health training (e.g., workshop, seminar) per year that educates all employees on the following topics:

   1. Hearing loss and well-being.[9]
   2. Audiometric results and hearing threshold levels.[9]
   3. Noise exposure levels.[9]
   4. Correct use of hearing protection.[9]

b. Manages the use and purchasing of hearing protection, audiometers and noise measuring equipment.[9]

c. Schedules annual audiometric evaluations for employees.[9]

d. Conducts an annual audit to determine that the hearing health conservation program adheres to OSHA, European Directive or equivalent regional regulations.[9,15,17]

e. Provides educational resources on hearing health to employees upon request.

Note : This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. WHO. Addressing The Rising Prevalence of Hearing Loss.; 2018. https://apps.who.int/iris/bitstream/handle/10665/260336/9789241550260-eng.pdf?sequence=1&ua=1%0Ahttp://www.hear-it.org/multimedia/Hear_It_Report_October_2006.pdf%0Afile:///C:/Users/E6530/Downloads/9789240685215_eng.pdf%

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

2. Gates GA, Mills JH. Presbycusis. Lancet. 2005;366(9491):24-30.

3. Rabinowitz PM. Noise-induced hearing loss. Am Fam Physician. 2000;61(9):2759-2760.

4. Daniel E. Noise and hearing loss: A review. J Sch Health. 2007;77(5):225-231. doi:10.1111/j.1746-1561.2007.00197.x

5. Shen Y, Ye B, Chen P, et al. Cognitive decline, dementia, Alzheimer's disease and presbycusis: Examination of the possible molecular mechanism. Front Neurosci. 2018;12(JUN):1-14. doi:10.3389/fnins.2018.00394

6. Thomson RS, Auduong P, Miller AT, Gurgel RK. Hearing loss as a risk factor for dementia: A systematic review. Laryngoscope Investig Otolaryngol. 2017;2(2):69-79. doi:10.1002/lio2.65

7. Ciorba A, Bianchini C, Pelucchi S, Pastore A. The impact of hearing loss on the quality of life of elderly adults. Clin Interv Aging. 2012;7:159-163. doi:10.2147/CIA.S26059

8. International AE, Vaughan G. Deafness and hearing loss. World Health Organization. https://www.who.int/en/news-room/fact-sheets/detail/deafness-and-hearing-loss. Published 2021.

9. Franks JR, Stephenson MR, Merry CJ. Preventing Occupational Hearing Loss: a Practical Guide. Natl Inst Occup Saf Heal. 1996;1996(June). doi:DHHS (NIOSH) Publication No. 96-110

10. NIOSH, Health WS and. They're your ears Protect them.

11. Verbeek J, Kateman E. Interventions to prevent occupational noise induced hearing loss. Cochrane Libr. 2009; (10). doi:10.1002/14651858.CD006396.pub3.Copyright

12. (NIDCD) NI on D and OCD. How Loud Is Too Loud ? How Long Is Too Long ? NIH Publ. 2010. doi:10.1037/e606602012-001

13. Rosenstock L. Criteria for a recommended standard: Occupational noise exposure. Natl Inst Occup Saf Heal. 1998;(June):1-122. doi:No. 98-126

14. Osha 3498-12n 2011. Ocucpatioinal Saf Heal Adm Adm. 2011.

15. Occupational Noise Exposure. Occup Heatlh Saf Adm. 2017. https://www.osha.gov/SLTC/noisehearingconservation/.

16. Safety O, States U, States U, et al. Occupational Noise Exposure. 2009.

17. OSHA. OSHA Technical Manual. 2011:1-2. doi:TED 01-00-015 [TED 1-0.15A]

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

MATERIALS

The WELL Materials concept aims to reduce human exposure, whether direct or through environmental contamination, to chemicals that may impact health during the construction, remodeling, furnishing and operation of buildings.

The chemicals industry is a central part of the global economy and is integral to a number of sectors that have played a major role in improving life expectancy and the quality of life over the past 150 years. However, the health and environmental impacts of most chemicals in circulation, despite their ubiquity, are unknown. Many of the chemicals that were ubiquitously used in the past have been found to be typically toxic, persistent and prone to bioaccumulation. Commonly used in building materials and products, these chemicals have a much longer use phase.

Legacy chemicals, a denomination that includes lead, asbestos, mercury, chromated copper arsenate (CCA) and polychlorinated biphenyls (PCBs), are now largely restricted in manufacture and use. However, they continue to pose dangers not only in older structures but also through their environmental fate.[1-3] For example, lead exposure accounted for an estimate of one million deaths in 2017 and can be considered as a global health priority, even in places where it is regulated.[4,5] Another example of a legacy contaminant is CCA, a biocide formerly used in outdoor wood structures that can leach arsenic and preservative components into the soil where children can be exposed.[6] The WELL Materials concept requires projects to assess the presence of these compounds and take measures to prevent human exposure along with restricting them in new products. In addition, testing, remediation and redevelopment of sites contaminated with these and many other toxic pollutants is encouraged, in order to support environmentally responsible growth and preventing sprawl.[7]

Beyond legacy compounds, other classes of chemicals, such as perfluorinated alkyl compounds (PFCs), orthophthalates, some heavy metals and halogenated flame retardants (HFRs), are often used in products because of their superior performance. However, the health and environmental impacts of many of the compounds in these classes are proven or considered to be deleterious, plus some of them are widely distributed throughout natural environments and as human metabolites.[8-10] The Materials concept promotes a precautionary approach, favoring substitutions of certain materials where replacements are available and do not pose sources of exposure for other chemicals of unknown or increased toxicity.

Chemicals may not be added to but also emitted from products. Volatile organic compounds (VOCs) comprise a large group of chemicals abundant in indoor environments due to various source materials, including insulation, paints, coatings, adhesives, furniture and furnishings, composite wood products and flooring materials,[11] and may significantly affect respiratory health and even increase cancer risks.[11] As this is particularly important for indoor air quality (IAQ) and health, the WELL Materials concept encourages the use of products tested for low VOC emissions.

The WELL Materials concept advances two strategies for selecting building materials and products. One is to increase literacy on materials by promoting ingredient disclosure, whereas the second is to promote the assessment and optimization of product composition in order to minimize impacts to human and environmental health. Both strategies aim to bridge data gaps in the supply chain, supporting innovation in green chemistry and advancing market transformation towards healthier and more sustainable products.

Finally, and because potentially hazardous products are introduced into buildings during their day-to-day operations, the WELL Materials concept promotes the use of low-hazard cleaning products and cleaning practices that reduce impacts in indoor air quality and in the health of those performing these duties.[12] To further promote mitigation of environmental contamination and protection of public health, the WELL Materials concept includes guidelines for the safe management of some types of waste.[13] Finally, the application of Integrated Pest Management (IPM) principles[14,15] and the use of low-hazard pesticides, along with signage and notice of application, further works to protect health.

Note : Read more about the evidence behind the WELL Materials Concept. Note: Material from the research digests is not covered on the WELL AP exam.

REFERENCES

1. Agency for Toxic Substances Disease Registry. Toxicological Profile for Lead. https://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=96&tid=22. Published 2007. Accessed January 2, 2020.
2. Furuya S, Chimed-Ochir O, Takahashi K, David A, Takala J. Global Asbestos Disaster. International Journal of Environmental Research and Public Health. 2018;15(5).

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

3. Agency for Toxic Substances Disease Registry. Toxicological Profile for Polychlorinated Biphenyls (PCBs). https://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=142&tid=26. Published 2000. Accessed January 2, 2020.
4. Tong S, Von Schirnding Y, Prapamontol T. Environmental lead exposure : a public health problem of global dimensions. The International Journal of Public Health. 2000;78(9):1068-1077.
5. UN Environment Programme. Global Chemicals Outlook II. From Legacies to Innovative Solutions: Implementing the 2030 Agenda for Sustainable Development. 2019.
6. Agency for Toxic Substances Disease Registry. CCA-Treated Wood Factsheet. https://www.atsdr.cdc.gov/CCA-Treated_Wood_Factsheet.pdf. Published 2011. Accessed Accessed on December 20, 2019.
7. Science Communication Unit. Brownfield Regeneration. In: University of the West of England (UWE), ed. Science for Environment Policy. Vol 39. Bristol 2013: https://ec.europa.eu/environment/integration/research/newsalert/pdf/39si_en.pdf.
8. Genuis SJ, Birkholz D, Ralitsch M, Thibault N. Human detoxification of perfluorinated compounds. Public Health. 2010;124(7):367-375.
9. Hammel SC, Levasseur JL, Hoffman K, et al. Children's exposure to phthalates and non-phthalate plasticizers in the home: The TESIE study. Environment International. 2019;132:105061.
10. Roze E, Meijer L, Bakker A, Van Braeckel Koenraad NJA, Sauer Pieter JJ, Bos Arend F. Prenatal Exposure to Organohalogens, Including Brominated Flame Retardants, Influences Motor, Cognitive, and Behavioral Performance at School Age. Environmental Health Perspectives. 2009;117(12):1953-1958.
11. U. S. Environmental Protection Agency. Volatile Organic Compounds' Impact on Indoor Air Quality. https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality. Published 2017. Updated November 6, 2017. Accessed January 22, 2020.
12. Garza JL, Cavallari JM, Wakai S, et al. Traditional and environmentally preferable cleaning product exposure and health symptoms in custodians. American Journal of Industrial Medicine. 2015;58(9):988-995.
13. Bill Conley SJ. Sustainability How-to Guide – Waste Stream Management. International Facility Management Association;2016.
14. San Francisco Department of the Environment ICC. Pest Prevention by Design. Authoritative Guidelines for Designing Pests Out of Structures. 2012.
15. U.S. Environmental Protection Agency. Integrated Pest Management in Buildings. 2011.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X01 MATERIAL RESTRICTIONS | P

Intent : To reduce or eliminate human exposure to building materials known to be hazardous.

Summary : This WELL feature restricts widely known hazardous ingredients in newly installed building materials, specifically asbestos, mercury and lead.

Issue : Historical use of hazardous materials in construction, specifically asbestos, mercury and lead, have presented serious and negative health impacts on humans. Disease caused by exposure to these chemicals, including asbestosis, developmental issues in children[1] and various forms of cancer still affect millions of people.[2] While these compounds have been restricted or banned in buildings in many countries, they still pose threats in countries that have not enacted the necessary limitations. As a result, exposure to these hazardous materials should be limited and, if possible, eliminated.

Solutions : Asbestos has been fully or partially banned for buildings in most countries and alternatives are widely available. Lead content in materials that may expose humans to its aspiration and ingestion is also restricted in many national regulations.[3] Use of products where lead content is minimized or not added can significantly reduce leaching from pipes into drinking water. Eliminating the use of compact fluorescent light bulbs (CFLs) removes a potential pathway for exposure to mercury.

PART 1 RESTRICT ASBESTOS

For All Spaces:

For newly installed or applied products within the project boundary, the following requirement is met:

a. The following product categories do not contain over 1,000 ppm of asbestos by weight or area:
   1. Thermal protection, including all insulation (lagging) applied to pipes, fittings, boilers, tanks and ducts.
   2. Acoustic treatments.
   3. Sheathing.
   4. Roofing and siding.
   5. Fire and smoke protection.
   6. Joint protection.
   7. Plaster and gypsum board.
   8. Ceilings.
   9. Resilient flooring.

PART 2 RESTRICT MERCURY

For All Spaces:

The following requirements are met:

a. Newly installed fluorescent, metal halide and sodium lamps, if present, meet one of the following:
   1. RoHS restrictions.[4]
   2. The following specifications:[5]

Fluorescent Lamp	Maximum Mercury Content
Compact, integral ballast	3.5 mg
Compact, no-integral ballast	3.5 mg
T-5, circular	9 mg
T-5, linear	2.5 mg
T-8, eight-foot	10 mg
T-8, four-foot	3.5 mg
T-8, U-bent	6 mg
High-Pressure Sodium Lamp	**Maximum Mercury Content**
400 W or less	10 mg
Over 400 W	32 mg

b. Newly installed fire alarm notification and initiating devices (e.g. strobes, pull stations); environmental, HVAC, occupancy and motion sensors and meters; and relays, thermostats and load break switches meet one of the following:
   1. RoHS restrictions.[4]
   2. Products contain no more than 0.1% (1000 ppm) of mercury by weight.

PART 3 RESTRICT LEAD

For All Spaces:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

1: Paints and electronics

The following requirements are met:

a. Newly installed fire alarms notification and initiating devices (e.g. strobes, pull stations); environmental, HVAC, occupancy and motion sensors and meters; and relays, thermostats and load break switches meet one of the following:
    1. RoHS restrictions.[4]
    2. Products contain no more than 0.1% (1000 ppm) of lead by weight.
b. Newly installed paints applied as finishes within the project boundary meet at least one of the following criteria:
    1. Paints have a lead concentration of 100 ppm (0.01%) by weight or below.
    2. Paints have no added lead carbonates and lead sulfates.
    3. Paints are deemed free of lead or with no added lead by an ISO 14024-compliant (Type 1) Ecolabel, or a voluntary third-party certification program recognized by the local government where the building is located.
    4. Paints meet Feature X08: Materials Optimization Part 1, Option 1 'Materials Selection' OR Part 2.

2: Drinking water pipes, fittings and solder

Pipes, fixtures, fittings and solder newly installed or applied within the project boundary intended for drinking water distribution and delivery meet at least one of the following:

a. The product is approved for use with drinking water by a local government authority or by a government-authorized certification body.
b. The product has a weighted wetted average of 0.25% of lead or less, verified by a third party, or is labeled as ANSI/NSF 372-compliant.

REFERENCES

1. Agency for Toxic Substances Disease Registry. Toxicological Profile for Lead. https://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=96&tid=22. Published 2007. Accessed January 2, 2020.
2. Furuya S, Chimed-Ochir O, Takahashi K, David A, Takala J. Global Asbestos Disaster. International Journal of Environmental Research and Public Health. 2018;15(5).
3. UN Environment Programme. Update on the Global Status of Legal Limits on Lead in Paint, September 2018. 2018.
4. European Parliament and the Council of the European Union. Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment. In. Vol 2011/65/EU Latest consolidated version: 22/07/2019 ed: Official Journal of the European Union; 2011.
5. U.S. Green Building Council. LEED BD+C: Healthcare | v4.1 - LEED v4.1 PBT source reduction - mercury. USGBC. https://www.usgbc.org/node/12022740. Published 2019. Accessed Accessed on December 19, 2019, 2019.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X02 INTERIOR HAZARDOUS MATERIALS MANAGEMENT | P

Intent : Manage risks of human exposure to hazardous materials ubiquitously used in past construction practices.

Summary : This WELL feature requires the application of practices to manage exposure risks of the hazardous building materials asbestos, lead and polychlorinated biphenyls (PCBs).

Issue : Some materials that were commonly used in construction due to their mechanical, chemical or visual properties have shown to be toxic, and are now banned or confined to limited production across the world. However, their ubiquitous presence still haunts our built and natural environments and can cause disease upon exposure. Asbestos, lead and polychlorinated biphenyls (PCBs)-containing materials are emblematic examples. Asbestos, a naturally present, chemically resistant material found in old adhesives, insulation and sheeting is a known toxicant and carcinogen. Exposure to asbestos-containing dusts is the main cause of mesothelioma and responsible for over 200,000 deaths annually.[1] Lead is found in paints for increasing their durability and impermeability. If ingested, absorbed or breathed-in, it accumulates in blood, tissues and bones, potentially disrupting body functions and impairing the intellectual development of children and the unborn during pregnancy.[2] PCBs were used in caulk and electrical equipment, but due to their persistence in the environment, bioaccumulation in foods and carcinogenicity, their production is banned worldwide.[3]

Solutions : Existing buildings must be evaluated for the presence of hazardous materials and consider their removal when technically feasible. If not possible, hazards must be isolated and periodically monitored to prevent human exposure. Generating dust that can become suspended and respirable must be avoided. Any waste generated from construction, or any other onsite activity must be handled appropriately in accordance with best practices.

PART 1 MANAGE ASBESTOS HAZARDS

For All Spaces:

Option 1: Asbestos risk assessment and remediation

The following requirements are met:

a. The building was constructed or last renovated before the enactment of laws banning the installation of asbestos-containing materials, or is located where there is no local asbestos phase-out regulation.

b. An inspector certified under local regulation or a qualified professional with demonstrable experience where no local regulations apply conducts an investigation of the project space and reports the following:

   1. A list of locations where presumed asbestos containing materials (PACM) were found.
   2. Confirmation of the presence of asbestos is performed through Polarized Light Microscopy (PLM), Scanning Electron Microscopy (SEM) or Transmission Electron Microscopy (TEM) testing. The sample number and location follow applicable laws or recommendations of the inspector conducting the assessment. Materials having over 1% of asbestos are considered ACM. If analytical confirmation is not available or possible, all PACM are considered asbestos-containing materials (ACM).

c. If asbestos-containing materials (ACM) were found per the above, an action plan that contains the following is implemented:

   1. Notification of any works to relevant authorities and persons living, working or transiting in the vicinity of the building or space.
   2. Preventative measures against the formation and spread of asbestos fibers in the air during remedial work.
   3. Measures taken for workers' protection during remediation activities, including but not limited to skin and respiratory protection.
   4. If ACM are being removed, activities are carried out for proper handling of ACM waste, including: wetting of all removed ACM, care in transportation to prevent crumbling, sealing and leak-tight transportation, proper labeling and final disposal in locations allowed by applicable laws and permits.
   5. Post-remediation clearance for occupancy confirmation by testing of fibers in air using phase contrast microscopy (PCM) or transmission electron microscopy (TEM) following standards referenced in applicable local laws or, if not available, NIOSH Manual of Analytical Methods (MNAM) Methods 7400 or 7402, GBZ/T192.5-2007, ISO 8672:2014, ISO 10312:2019 or ISO 13794:2019. The number of samples and sampling conditions must meet local regulations and/or conform to ISO 16000-7.
   6. If any of the asbestos is managed by methods other than removal, the month and year of follow-up inspection to evaluate the structural integrity of the ACM must be stated and cannot exceed three years from the date of the last inspection.

OR

Option 2: New spaces

The following requirement is met:

a. The building was constructed after the enactment of an asbestos ban in construction products.

OR

Option 3: Demonstration of prior remediation

The following requirements are met:

a. The project was last renovated after the enactment of local laws banning the installation of asbestos-containing materials.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

b. The project demonstrates that asbestos remediation and clearance is a legal requirement to grant occupancy of the space.

PART 2 MANAGE LEAD PAINT HAZARDS

For All Spaces:

Option 1: Identify lead paint hazards

The following requirements are met:

a. A certified inspector or a qualified professional where no local regulations apply conducts an investigation of the space and reports the following:
    1. An inventory of locations of potential sources and sinks of lead-containing materials, where lead-containing paint may be present.
    2. Confirmation of lead hazards through in-situ test results by x-ray fluorescence (XRF) or by laboratory analyses of paint chips[4] and/or surface dusts. Surface dust is considered a hazard if its lead loading is more than 10 µg/ft^2 of the collection area if sampled from floors or over 100 µg/ft^2 for dust on interior window sills.[5] Paints having over 0.5% of lead by weight or 930 µg/ft^2 of applied area and bare soil containing over 400 ppm of lead by weight are also considered lead hazards.[5] Lower thresholds mandated by local regulations prevail for terms of hazard assessment.

b. If lead is found in the investigation, a certified inspector (or a qualified professional where no local regulations apply) implements an action plan that contains the following:
    1. Notification of remediation work to occupants and transient populations in the surrounding spaces, and restriction of access to work areas during remediation.
    2. If paints are mechanically removed, measures are taken to minimize the formation and spread of dusts during the remediation process and to ensure adequate respiratory and skin protection for workers.
    3. A re-inspection schedule that includes visual assessments and dust testing, if any lead-containing paints are left in place and are subject to stabilization (i.e., painted over with products to prevent chipping or degradation) or enclosure, at least once every three years.
    4. Post-remediation clearance, confirming that the lead loading in dust is below the levels deemed hazardous.

OR

Option 2: New spaces

The following requirement is met:

a. The building was constructed after the enactment of lead paint ban.

OR

Option 3: Demonstration of prior remediation

The following requirements are met:

a. The project was last renovated after the enactment of local laws banning the application of lead-containing paint.

b. The project demonstrates through legal documentation (e.g., approved certificates of occupancy, remediation reports submitted to relevant authorities) that lead remediation was performance and clearance was provided.

PART 3 MANAGE POLYCHLORINATED BIPHENYL (PCB) HAZARDS

For All Spaces:

Option 1: PCB remediation

The following requirements are met:

a. The building was constructed or last renovated before the institution of any applicable laws banning or restricting PCBs, and is undergoing renovation work that disturbs (i.e., partially or fully removes) materials likely to contain PCBs such as caulking, fluorescent light ballasts and capacitors of appliances fabricated before 1980.

b. An inspection strategy for assessing PCB-related risks is implemented and contains the following:
    1. Determination of locations where materials potentially containing PCBs may be disturbed.
    2. If caulk is to be disturbed or removed, analysis of the presumably PCB-containing material following protocols mandated by local laws or, in absence of local laws, by any applicable US EPA[6] or ISO testing methods.

c. If PCBs are found in disturbed materials, an action plan is implemented and contains the following:
    1. Notification of remedial work to relevant authorities and building occupants.
    2. Preventative measures against the spread of PCB-containing dusts and human exposure during remediation activities, including restricting access for those not involved in the work.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

3. Protective measures for workers, including chemical-resistant gloves, clothing protection, goggles and respirators.
4. Waste handling that minimizes the spread of contaminated debris and safe disposal of PCB-containing waste in locations allowed by applicable local regulations.

OR

Option 2: No PCB remediation

One of the following is met:

a. The building was constructed or last renovated before the institution of any applicable laws banning or restricting PCBs, and the project is not undergoing renovation work that disturbs (i.e., partially or fully removes) materials likely to contain PCBs such as caulking, fluorescent light ballasts and capacitors of appliances fabricated before 1980.

b. The building was constructed or last renovated after the institution of any applicable laws banning or restricting PCBs.

REFERENCES

1. Furuya S, Chimed-Ochir O, Takahashi K, David A, Takala J. Global Asbestos Disaster. International Journal of Environmental Research and Public Health. 2018;15(5).
2. Agency for Toxic Substances Disease Registry. Toxicological Profile for Lead. https://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=96&tid=22. Published 2007. Accessed January 2, 2020.
3. Agency for Toxic Substances Disease Registry. Toxicological Profile for Polychlorinated Biphenyls (PCBs). https://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=142&tid=26. Published 2000. Accessed January 2, 2020.
4. World Health Organization. Brief guide to analytical methods for measuring lead in paint. 2011.
5. US Environmental Protection Agency. Dust-Lead Hazard Standards; Definition of Lead-Based Paint. In: US EPA, ed. Vol 2019-14024. Washington, DC2019.
6. US Environmental Protection Agency. How to Test for PCBs and Characterize Suspect Materials. Published 2018. Accessed December 16, 2019, 2019.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X03 CCA AND LEAD MANAGEMENT | P

Intent : Mitigate risks of human exposure to chromate copper arsenate (CCA) and lead.

Summary : This WELL feature requires addressing risks associated with human exposure to chromate copper arsenate (CCA) in existing wood structures and lead in soil, playground equipment and artificial turf.

Issue : In the 2000s, the application of CCA (or 'pressure-treated wood') was restricted due to health concerns connecting its presence to arsenic exposure to humans, animals and food crops, and[1] exposure to arsenic is known to cause increased risk of skin, liver, bladder and lung cancers. [2] However, prior to its restriction, CCA was a widely used wood treatment for decades. As a result, CCA presence in our environment still poses as a threat to our health. Additionally, chromates which are catalogued as carcinogenic to humans[3] can be inhaled if CCA-containing wood is ever burnt. Among other existing external hazards is lead, which may be present in paints used on outdoor structures and playgrounds.[4] Lead may also contaminate soils upon chipping, in fibers of artificial turf[5] and in some loose rubber.[6]

Solutions : Identifying and remediating hazards associated with CCA and lead should reduce risk of exposure to and dispersion of contaminants in the environment through leachates. Although not all routes of exposure and bioavailability of lead are fully understood,[6] ingestion and inhalation of lead-containing particles may occur due to contaminated paint or rubber crumbs and, thus, from a precautionary standpoint, testing for lead is recommended.[7]

PART 1 MANAGE EXTERIOR CCA HAZARDS

For All Spaces:

Option 1: CCA assessment and remediation

For all existing wood structures installed before the enactment of laws banning chromated copper arsenate (CCA) which lie outside the building envelope but within the project boundary where human presence is expected (e.g., wooden decks, fences near walkways, playgrounds and outdoor furniture), the following requirements are met:

a. Identify CCA-containing wood through one of the following:
    1. Inspection of purchase records.
    2. Determination of whether legal bans for CCA apply.
    3. Testing for the presence of arsenic in the wood or the soil bearing the wooden structures.
b. Address CCA-containing woods through one of the following:
    1. Dispose of CCA-containing woods following applicable laws, without incinerating nor wood chipping.
    2. Treatment with penetrating (non-film-forming), oil-based, semi-transparent stains that prevent arsenic leaching on a regular basis as recommended by the manufacturer.

OR

Option 2: CCA assessment not required

One of the following is met:

a. All existing wood structures that lie outside the building envelope but within the project boundary where human presence is expected (e.g., wooden decks, fences near walkways, playgrounds and outdoor furniture) were installed after the enactment of laws banning chromated copper arsenate (CCA).
b. The project does not have wood structures that lie outside the building envelope but within the project boundary.
c. The project does not have spaces outside the building envelope but within the project boundary.

PART 2 MANAGE LEAD HAZARDS

For All Spaces:

Option 1: Lead assessment

The project addresses lead hazards through the following:

a. The top 0.6 in layer in all existing outdoor bare soil (outside the building envelope, post-construction, not covered by grass, vegetation or other landscaping including mulch covered soil) is tested for lead. Each continuous area of bare soil is sampled at least once. If the lead concentration of any sample surpasses 400 ppm by weight,[8] then the following is performed:
    1. A second set of samples is taken at 6 in, 12 in, 18 in and 24 in deep.[9]
    2. If these samples are above 400 ppm by weight, soil is replaced with soil from another source to the extent of the deepest sample found above this threshold.
b. Lead in existing artificial turf fibers is assessed as follows:[5]
    1. If lead concentration of synthetic turf fibers is unknown, test a sample of fibers to determine the lead concentration using an EPA, ISO or locally accepted protocol.
    2. If the total lead concentration of synthetic turf fibers is greater than 136 mg/lb, perform dust-wipe testing per EPA, ISO or locally accepted protocol for dust-wipe testing to determine the surface dust-lead loading.
    3. If the wipe-testing results show total lead loadings greater than 40 µg/ft^2, replace with turf containing lead concentrations less than 136 mg/lb.
c. If existing loose-fill rubber from recycled tires is present on playgrounds, sporting fields, or other surfaces, the

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

surface is assessed and remediated per the following:

1. Sample the loose-fill rubber using an EPA, ISO or locally accepted protocol for lead testing and perform lead content analysis.
2. If the loose rubber results show total lead loadings greater than 136 mg/lb of rubber, replace the loose-fill rubber.

d. Paint applied to existing playground equipment, installed and painted before the enactment of banning laws, is assessed for lead and removed, as necessary, per the guidance below:

1. Assess the integrity and age of the paint. If the paint is cracked, peeled or chipped collect a sample for laboratory analysis for lead. Follow guidelines and methods described by the World Health Organization[10] or local equivalents for sampling and laboratory analysis.
2. Remove or encapsulate the paint from the playground equipment if the sample contains lead at a concentration over 90 ppm. Removal duties must be performed by a certified specialist or someone with demonstrable experience where no local regulations apply.

e. Newly installed bare soil, artificial turf fibers and rubber fills are certified by the manufacturer or by a third party to not contain lead above the remediation thresholds stated above.

OR

Option 2: Lead assessment not applicable

The following requirements are met:

a. The project does not have existing post-construction outdoor bare soil (e.g., not covered by grass, vegetation or mulch).

b. The project does not have artificial turf.

c. The project does not have loose-fill rubber from recycled tires.

d. Paint applied to existing playground equipment was installed and painted after the enactment of banning laws, or no playground equipment is present.

REFERENCES

1. Agency for Toxic Substances Disease Registry. CCA-Treated Wood Factsheet. https://www.atsdr.cdc.gov/CCA-Treated_Wood_Factsheet.pdf. Published 2011. Accessed Accessed on December 20, 2019.
2. Agency for Toxic Substances Disease Registry. Toxicological Profile for Arsenic. https://www.atsdr.cdc.gov/toxprofiles/TP.asp?id=22&tid=3. Published 2015. Updated 2015. Accessed Accessed on December 20, 2019.
3. International Agency for Research on Cancer. Chromium (VI) Compounds. Lyon, France: International Agency for Research on Cancer; 2012.
4. U.S. Consumer Product Safety Commission. CPSC Staff Recommendations for Identifying and Controlling Lead Paint on Public Playground Equipment. U.S. Consumer Product Safety Commission,. http://www.cpsc.gov/en/Business--Manufacturing/Business-Education/Lead/CPSC-Staff-Recommendations-for-Identifying-and-Controlling-Lead-Paint-on-Public-Playground-Equipment/. Published 1996. Accessed May 12, 2016.
5. Ulirsch G, Gleason K, Gerstenberger S, et al. Evaluating and regulating lead in synthetic turf. Environmental Health Perspectives. 2010;118(10):1345-1349.
6. U.S. EPA & CDC/ATSDR. Synthetic Turf Field Recycled Tire Crumb Rubber Research Under the Federal Research Action Plan Final Report: Part 1 - Tire Crumb Characterization (Volumes 1 and 2). U.S. Environmental Protection Agency, Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry.; July 25, 2019 2019. EPA/600/R-19/051.
7. U. S. Environmental Protection Agency. Protect Your Family from Exposures to Lead. https://www.epa.gov/lead/protect-your-family-exposures-lead. Published 2019. Accessed March 9th, 2020.
8. U.S. Department of Housing and Urban Development. Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing. In: Office of Healthy Homes and Lead Hazard Control, ed. Washington, DC2012.
9. U.S. Environmental Protection Agency. Soil Sampling at Lead-Contaminated Residential Sites. In. Vol Method 4230.19A. Washington, DC2007.
10. World Health Organization. Brief guide to analytical methods for measuring lead in paint. 2011.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X04 SITE REMEDIATION | O (MAX : 1 PT)

Intent : Promote the safer development of potentially contaminated sites by assessing and mitigating hazards.

Summary : This WELL feature requires site assessment, testing and remediation for the development of contaminated sites.

Issue : Contaminated soil, usually associated with past industrial activities, can leach toxic chemicals into nearby groundwater or surface waters, accumulate in sediments, volatilize and pose hazards to indoor air in buildings on the premises or be carried by wind-borne dust.[1] When left unmanaged, contaminants from such sites can pose risks to those who live and work nearby through inhalation, ingestion or dermal contact.[2] Contamination in these sites, which are known as brownfields, [1] may complicate development if not properly addressed.

Solutions : Site assessment and remediation can reduce risk of exposure to populations that live in proximity to contaminated sites. Cleanup of contaminated sites that can present environmental (e.g. air, water, soil) and human health hazards helps protect the public from associated hazards and encourages environmentally responsible growth,[3] further preserving undeveloped land.

PART 1 ASSESS AND MITIGATE SITE HAZARDS (MAX : 1 PT)

For All Spaces:

The following requirements are met:

a. Site was used for or affected by past or present industrial activities (e.g., hazardous waste storage, fuel station, manufacturing plant, on-site dry cleaners, automotive repair or brownfields).

b. Site is assessed for potential contamination in soil or underground water from past uses or surrounding conditions using one of the following:

   1. Local applicable regulation for environmental site assessments.
   2. Guidelines provided in the standard ASTM E1527-05 (Phase I site assessments).

c. If the site investigation establishes the potential presence of contaminants, the project implements a sampling strategy to quantify contamination and determine remediation needs according to local regulations or ASTM E1903-97 (Phase II site assessment) guidelines.

d. If remediation is required, the project implements a sustainable remediation plan before, during and after construction that integrates the following:[3,4]

   1. A risk-based approach to sustainable remediation (risk assessment/risk-benefit analysis).
   2. A tiered approach to assessment and an appraisal of remediation options.
   3. Safe working practices for workers during remediation.
   4. Record keeping of decision-making and assessment processes.
   5. Protocol for engaging stakeholders, including management of the impacts on the community.

REFERENCES

1. U. S. Environmental Protection Agency. Contaminated Land. Report on the Environment (ROE) Web site. https://www.epa.gov/report-environment. Published 2017. Accessed February 5th, 2020.
2. University of the West of England. Soil Contamination: Impacts on Human Health Science for Environment Policy. Bristol: European Commission;2013.
3. Rizzo E, Bardos P, Pizzol L, et al. Comparison of international approaches to sustainable remediation. Journal of Environmental Management. 2016;184:4-17.
4. International Standards Organisation. Soil quality — Sustainable remediation. In:2017.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X05 ENHANCED MATERIAL RESTRICTIONS | O (MAX : 2 PT)

Intent : Minimize the exposure to certain chemicals by limiting their presence in products.

Summary : This WELL feature requires restricting chemicals found in products commonly installed in buildings.

Issue : The materials industry has been able to develop and adapt products to satisfy the needs of the market. However, some newly introduced chemicals that pose to be advantageous from a performance or cost perspective, may be associated with negative health effects. Populations that prove to be the most vulnerable to these chemicals are unborn and young children, as well as pregnant women.[1,2] Chemical classes with compounds suspected or proven to pose health concerns include orthophthalates (common plasticizers), halogenated flame retardants (HFR)[1,3] and other per-fluorinated compounds (PFCs) and heavy metals, in addition to formaldehyde.[4] Common pathways of exposure to these compounds are through inhalation, skin contact or swallowing of dusts, soils or larger particles. Overall, there is a great research gap in assessing the safety of these and many other chemicals,[5] driven both by their ubiquity in the environment, as well as their presence in the human body. For instance, Per- and polyfluoroalkyl substances (PFAS) such as perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) are persisting PFCs in natural environments (including sources of drinking water) and found in humans.[6] Metabolites of orthophthalates are partially metabolized by the body and commonly found in urine.[7]

Solutions : Selecting products that are devoid of or have reduced amount of chemicals associated with health concerns may help to prevent exposure to these compounds. Some organizations have published regulations, guidelines or certifications that restrict or minimize the presence of certain chemicals from these classes.

PART 1 SELECT COMPLIANT INTERIOR FURNISHINGS (MAX : 1 PT)

For All Spaces:

1: Furniture, millwork and fixtures

At least 50% by cost of newly installed furniture, millwork and fixtures (minimum 10 distinct products), as defined in Appendix X1, meet one of the following requirements:

a. Textiles (i.e., fabrics including upholstery) and plastics in products contain 100 ppm (0.01%) by weight or less of the below compounds and chemical classes, unless higher amounts are mandated by local codes. For assessing compliance of a product, all pieces of each of the two material categories (textiles, plastics) are grouped together and each material category is assessed independently against the 100 ppm threshold:
    1. Halogenated flame retardants (HFR).
    2. Per- and polyfluoroalkyl substances (PFAS).
    3. Lead.
    4. Cadmium.
    5. Mercury.
b. Do not contain textiles and plastic.

2: Electrical and electronic products

All newly installed electrical and electronic products, as specified in Appendix X1, meet the following requirement:

a. Products are compliant with RoHS restrictions.

PART 2 SELECT COMPLIANT ARCHITECTURAL AND INTERIOR PRODUCTS (MAX : 1 PT)

For All Spaces:

At least 50% by cost of newly installed products under the classes listed below, as defined by Appendix X1 (minimum 10 distinct products), meet the following requirements, unless higher amounts are mandated by local code:

a. Flooring products contain 100 ppm (0.01%) by weight or less of the following:
    1. Halogenated flame retardants (HFR).
    2. Per- and polyfluoroalkyl substances (PFAS).
    3. Orthophthalates.
b. Insulation products, including thermal and acoustic insulation in walls, ceilings, ducts, tubes and pipes, contain 100 ppm (0.01%) by weight or less of halogenated flame retardants (HFR).
c. Ceiling and wall finishes and demountable wall partitions contain 100 ppm (0.01%) by weight or less of the following:
    1. Halogenated flame retardants (HFR).
    2. Orthophthalates.
d. Pipes and fittings intended for drinking water distribution and delivery contains 100 ppm (0.01%) by weight or less of orthophthalates.

REFERENCES

1. Roze E, Meijer L, Bakker A, Van Braeckel Koenraad NJA, Sauer Pieter JJ, Bos Arend F. Prenatal Exposure to Organohalogens, Including Brominated Flame Retardants, Influences Motor, Cognitive, and Behavioral Performance at School Age. Environmental Health Perspectives. 2009;117(12):1953-1958.
2. Tsuda S. Differential toxicity between perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). The Journal of Toxicological Sciences. 2016;41(Special):SP27-SP36.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

3. Eriksson P, Jakobsson E, Fredriksson A. Brominated flame retardants: a novel class of developmental neurotoxicants in our environment? Environmental Health Perspectives. 2001;109(9):903-908.
4. Nielsen GD, Larsen ST, Wolkoff P. Re-evaluation of the WHO (2010) formaldehyde indoor air quality guideline for cancer risk assessment. Archives of Toxicology. 2017;91(1):35-61.
5. Wilson Michael P, Schwarzman Megan R. Toward a New U.S. Chemicals Policy: Rebuilding the Foundation to Advance New Science, Green Chemistry, and Environmental Health. Environmental Health Perspectives. 2009;117(8):1202-1209.
6. Genuis SJ, Birkholz D, Ralitsch M, Thibault N. Human detoxification of perfluorinated compounds. Public Health. 2010;124(7):367-375.
7. Hammel SC, Levasseur JL, Hoffman K, et al. Children's exposure to phthalates and non-phthalate plasticizers in the home: The TESIE study. Environment International. 2019;132:105061.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X06 VOC RESTRICTIONS | O (MAX : 4 PT)

Intent : Minimize the impact of volatile organic compounds (VOCs) emitted by products on indoor air quality.

Summary : This WELL feature requires adherence to emission thresholds for materials placed inside the building envelope.

Issue : VOCs encompass a wide group of volatile substances of both natural and artificial origins which have a wide range of health effects from nose, eye and throat irritation, headaches and nausea to liver, kidney and central nervous system damage.[1] Furthermore, some select VOCs are known or suspected carcinogens. [1] While these compounds are present outside, buildings are a net source due to human activities, cleaning practices and emissions from materials.[2] Newly installed furniture, insulation, flooring as well as wet-applied products such as paints, adhesives, sealants and coatings can significantly introduce VOCs into living spaces[3] for approximately one to two years,[4] and sometimes causing elevated concentrations in enclosed spaces like wardrobes.[5] These compounds can react in many ways to form new compounds and respirable particles, even seemingly impacting air pollution outdoors. [2]

Solutions : The selection of products with low or no VOC emissions is instrumental to prevent worsening in air quality. When VOCs are emitted, careful material selection in newly built spaces has been shown to accelerate VOCs reduction (i.e. off-gassing) to background levels.[6] Reducing level of toxic compound emission will also help to reduce the demands of ventilation.[4] Off-gassed products (e.g., reused furniture) also limit further emissions.

PART 1 LIMIT VOCS FROM WET-APPLIED PRODUCTS (MAX : 2 PT)

For All Spaces:

Newly installed interior wet-applied paints, coatings, adhesives, and sealants (minimum 10 distinct products or applied to at least 10% of project area) meet the following:

a. All products are tested to meet methods and thresholds established in one of the following standards and/or regulations for VOC content:
   1. SCAQMD Rule 1168 (Adhesives and Sealants, 2017).
   2. GB 33372-2020 (Adhesives).
   3. 2019 CARB SCM for Architectural Coatings.[7]
   4. EU Ecolabel for indoor and outdoor paints and varnishes.
   5. HJ 2537-2014 (Paints).
   6. Any other compliance path listed in the 'VOC content evaluation' section of the 'Low-Emitting Materials' credit of the LEED v4.1 standard.[8]
b. At least 75% of products (by surface area or volume) are tested by a third-party laboratory to meet testing methods and thresholds established in one of the following standards and/or regulations for VOC emissions:
   1. California Department of Public Health (CDPH) Standard Method v1.2.
   2. AgBB.[9]
   3. European Union LCI VOC thresholds[10] following EN 16516-1:2017 testing methods.
   4. Any compliance path accepted to meet the VOC emission requirements of the 'Low-Emitting Materials' credit of the LEED v4.1 standard.[8]

PART 2 RESTRICT VOC EMISSIONS FROM FURNITURE, ARCHITECTURAL AND INTERIOR PRODUCTS (MAX : 2 PT)

For All Spaces:

Products within one or more categories and corresponding thresholds in Table 1 meet one of the following compliance requirements, earning points as shown in Table 2: Table 1:

Product Category (from Appendix X1)	Threshold for Compliance
Flooring	90% of cost or surface area
Furniture, millwork and fixtures	75% by cost
Insulation, ceiling and wall panels	75% by cost or surface area

Table 2:

Tier	Achievement	Points
1	One compliant product category	1
2	At least two compliant product categories	2

a. Tested per methods and VOC emission thresholds established in one of the following:
   1. California Department of Public Health (CDPH) Standard Method v1.2.
   2. AgBB.[9]
   3. European Union LCI VOC thresholds[10] following EN 16516-1:2017 testing methods.
   4. ANSI/BIFMA e3-2014, sections 7.6.1 or 7.6.2 (Furniture).
   5. Any compliance path accepted to meet the VOC emission requirements of the 'Low-Emitting Materials' credit

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

of the LEED v4.1 standard.[8]

b. Made exclusively with one or a combination of (without organic additives): metal (including powder-coated, plated and anodized materials), untreated wood and plant products, glass, ceramic, concrete or stone.

c. If custom-made or refurbished, wet-applied and wood-based materials used in fabrication or refurbishing meet the following:

   1. All paints, coatings, sealants and adhesives applied to the product are verified as low-VOC emitting by one of the applicable standards listed in Part 1.
   2. All composite wood panels, including medium-density fiberboard, plywood and particle wood panels meet the 'Formaldehyde emissions evaluation' criterium of the 'Low-Emitting Materials' credit of the LEED v4.1 standard,[8] or meet one of the following: US EPA TSCA Title VI, Europe E1, Japan Four-star.

d. Installed for at least 6 months before enrollment or the start of subscription or manufactured and unmodified at least one year before enrollment or the start of subscription.

REFERENCES

1. U. S. Environmental Protection Agency. Volatile Organic Compounds' Impact on Indoor Air Quality. https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality. Published 2017. Updated November 6, 2017. Accessed January 22, 2020.
2. Abbatt JPD, Wang C. The atmospheric chemistry of indoor environments. Environmental Science: Processes & Impacts. 2020.
3. Chan CS, Lee SC, Chan W, et al. Characterisation of Volatile Organic Compounds at Hotels in Southern China. Indoor and Built Environment. 2011;20(4):420-429.
4. Holøs SB, Yang A, Lind M, Thunshelle K, Schild P, Mysen M. VOC emission rates in newly built and renovated buildings, and the influence of ventilation – a review and meta-analysis. International Journal of Ventilation. 2019;18(3):153-166.
5. Kang J, Liu J, Pei J. The indoor volatile organic compound (VOC) characteristics and source identification in a new university campus in Tianjin, China. Journal of the Air & Waste Management Association. 2017;67(6):725-737.
6. Suzuki N, Nakaoka H, Nakayama Y, et al. Changes in the concentration of volatile organic compounds and aldehydes in newly constructed houses over time. International Journal of Environmental Science and Technology. 2020;17(1):333-342.
7. California Air Resources Board. California Air Resources Board (CARB) Suggested Control Measure for Architectural Coatings In. Vol CARB SCM 20192019.
8. U.S. Green Building Council. LEED BD+C: New Construction | v4.1 - LEED v4.1 Low-Emitting Materials. https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthc-178. Published 2018. Accessed June 1, 2020.
9. AgBB. Evaluation procedure for VOC emissions from building products. Part 3: LCI Values. In:2018.
10. European Commission. EU-LCI Values. Published 2019. Accessed January 27, 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X07 MATERIALS TRANSPARENCY | O (MAX : 3 PT)

Intent : Promote material transparency across building material and product supply chain.

Summary : This WELL feature requires the compilation and availability of product descriptions, with ingredients evaluated and disclosed through transparency programs.

Issue : The global supply chain for material production is multi-tiered and complex, and technical and chemical knowledge throughout the supply chain varies greatly. As a result, there is a lack of robust data and knowledge about different chemicals and their effects on human health.[1] Such limitations in awareness prevents the adoption and use of chemicals believed to be safer in the industry.[2] Additionally, building and construction materials are not required to have complete ingredient lists, which makes it difficult to make fully informed choices when selecting safer products.

Solutions : Growing scientific and public concern over chemical exposure has prompted the introduction of a number of disclosure tools to help differentiate safer ingredients and products. Labels that promote material ingredient disclosure encourage supply chain transparency and work to bridge the information gap between manufacturers and users. Further, promoting awareness of and education on material ingredient content through product labeling can help enable informed decision making.

PART 1 SELECT PRODUCTS WITH DISCLOSED INGREDIENTS (MAX : 1 PT)

For All Spaces:

For at least 25 distinct, permanently installed products (including flooring, insulation, wet-applied products, lighting fixtures, ceilings, and wall assemblies and systems), furniture and task and floor lamps, ingredients are disclosed by the manufacturer, a disclosure organization or a third party through one of the following:

a. A Declare label, operated by the International Living Future Institute.[3]

b. A Health Product Declaration (HPD) published in the HPD Public Repository, operated by the Health Product Declaration Collaborative.[4]

c. A Cradle-to-Cradle Certified™ product, a C2C Certified® Circularity product, or a product with a Material Health Certificate from the Cradle to Cradle Products Innovation Institute.[5]

d. A Product Lens Certification™, operated by UL.[6]

e. A Product Health Declaration, operated by Global Green Tag.[7]

f. A BIFMA Level scorecard compliant with BIFMA e3-2019 standard that demonstrates achievement of 4 points or more in credits 7.5.1.1, 7.5.2.2, or achievement of Option 1 in credit 7.5.3.

g. A building product declaration listed in the eBDV database, for a product classified as 'Recommended' by the Byggvarubedömningen criteria, version 7.1 or more recent.

h. A manufacturer's inventory containing CAS numbers of all individual compounds down to 1,000 ppm (0.1%). If the product contains a trade secret compound, GHS hazards of category 1 or 2 are listed and a concentration range is provided for each undisclosed component.

PART 2 SELECT PRODUCTS WITH ENHANCED INGREDIENT DISCLOSURE (MAX : 1 PT)

For All Spaces:

For at least 15 distinct permanently installed products (including flooring, insulation, wet-applied products, lighting fixtures, ceilings, and wall assemblies and systems), furniture and task and floor lamps, the following requirements are met:

a. All ingredients are disclosed down to 100 ppm.

b. All ingredients are publicly disclosed by the manufacturer, a disclosure organization or a third party through one of the following:

   1. A Declare label, operated by the International Living Future Institute.[3]
   2. A Health Product Declaration (HPD) published on the HPD repository.[4]
   3. A building product declaration listed in the eBDV database, for a product classified as 'Recommended' by the Byggvarubedömningen criteria, version 7.1 or more recent.
   4. Manufacturer's disclosure and/or through a third-party materials database platform. If the product contains a trade secret compound, GHS hazards of category 1 or 2 are listed and a concentration range is provided for each undisclosed component.

PART 3 SELECT PRODUCTS WITH THIRD-PARTY VERIFIED INGREDIENTS (MAX : 1 PT)

For All Spaces:

For at least 15 distinct permanently installed products (including flooring, insulation, wet-applied products, lighting fixtures, ceilings and wall assemblies and systems), furniture and task and floor lamps, the following requirements are met:

a. All ingredients are disclosed through one of the following:

   1. A Declare label, operated by the International Living Future Institute.[3]

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

2. A Health Product Declaration (HPD) published in the HPD Public Repository, operated by the Health Product Declaration Collaborative.[4]
3. A Cradle-to-Cradle Certified™ product, a C2C Certified® Circularity product, or a product with a Material Health Certificate from the Cradle to Cradle Products Innovation Institute.[5]
4. A Product Lens Certification™, operated by UL.[6]
5. A Product Health Declaration, operated by Global Green Tag.[7]
6. A BIFMA Level scorecard compliant with BIFMA e3-2019 standard that demonstrates achievement of 4 points or more in credit 7.5.2.2, or achievement of Option 1 in credit 7.5.3.

b. Ingredient disclosure is verified by a third party (i.e., an organization other than the manufacturer that is not affiliated with the ingredient disclosure certificate).

REFERENCES

1. Scruggs CE, Nimpuno N, Moore RBB. Improving information flow on chemicals in electronic products and E-waste to minimize negative consequences for health and the environment. Resources, Conservation and Recycling. 2016;113:149-164.
2. Scruggs CE. Reducing hazardous chemicals in consumer products: proactive company strategies. Journal of Cleaner Production. 2013;44:105-114.
3. International Living Future Institute. Declare. https://declare.living-future.org/. Published 2020. Accessed.
4. Health Product Declaration Collaborative. HPD Public Repository. https://hpdrepository.hpd-collaborative.org/. Published 2020. Accessed.
5. Cradle to Cradle Products Innovation Institute. What is Cradle to Cradle Certified™? Published 2020. Accessed.
6. UL LLC. Product Lens™ Certification Program. https://www.ul.com/resources/product-lens-certification-program. Published 2020. Accessed.
7. Global Green Tag Intl. PTY Ltd. Product Health Declaration™ - The PHD Tool. https://www.globalgreentag.com/get-certified/product-health-declaration-the-phd-tool/. Published 2020. Accessed.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X08 MATERIALS OPTIMIZATION | O (MAX : 2 PT)

Intent : Promote the selection of products that have been audited to minimize impacts on human and environmental health.

Summary : This WELL feature requires screening and labeling of products in accordance with programs that audit and restrict the use of hazardous ingredient contents in materials and products.

Issue : The vast quantity and variety of chemicals flowing through the global economy makes the task of tracing possible environmental and human health impact extremely difficult. In response to growing concerns over hazardous material and product ingredients, a number of screening and certification schemes have been introduced to the market to help differentiate safer alternatives.[1]

Solutions : Screening and certification schemes that analyze and restrict the use of hazardous ingredients in building materials— those that are environmental contaminants and/or pose human health hazards—can mitigate exposure to potentially harmful substances, help increase the demand for these products and ultimately catalyze market transformation.[2]

PART 1 SELECT MATERIALS WITH ENHANCED CHEMICAL RESTRICTIONS (MAX : 1 PT)

For All Spaces:

Option 1: Materials selection

For at least 25 distinct permanently installed products (including flooring, insulation, wet-applied products, ceiling and wall assemblies and systems), furniture and task and floor lamps, the following requirements are met:

a. Have ingredients inventoried to 100 ppm.

b. Meet one of the following:

   1. Product is free of compounds listed in the Living Building Challenge's Red List v.4.0.[3]
   2. Product meets the chemical thresholds in the Cradle to Cradle Basic Level Restricted Substances List, version 4.[4]
   3. Product does not contain compounds listed in REACH Restriction, Authorization and SVHC lists.
   4. Product meets an optimization path listed under 'Advanced Inventory & Assessment' in Option 2 of LEED v4.1 credit 'Building Product Disclosure and Optimization - Material Ingredients'.[5]

OR

Option 2: Future purchase of compliant products

For projects with less than 25 distinct newly and permanently installed products (including flooring, insulation, wet-applied products, ceiling and wall assemblies and systems), furniture and task and floor lamps, the following requirement is met:

a. Products purchased for future repair, renovation or replacement of building materials comply with chemical restrictions of Option 1 'Materials Selection'.

Note : For recertification, projects must provide product specification sheets for purchases of eligible products occurring after initial certification.

PART 2 SELECT OPTIMIZED PRODUCTS (MAX : 1 PT)

For All Spaces:

At least 15 distinct permanently installed products (including flooring, insulation, wet-applied products, ceiling and wall assemblies and systems), furniture and task and floor lamps, are certified under one of the following programs:

a. Cradle to Cradle Certified™ products with a Silver, Gold or Platinum level in the Material Health category or products with a Silver, Gold or Platinum level Material Health Certificate from the Cradle to Cradle Products Innovation Institute.[6]

b. Living Product Challenge, Materials and Health & Happiness Petals or Living Product Certification, operated by the International Living Future Institute.[7]

c. Global GreenTag Product Health Declaration, with a GreenTag HealthRATE™ mark at SilverHEALTH, GoldHEALTH or PlatinumHEALTH level, operated by Global GreenTag Intl. Pty Ltd.[8]

REFERENCES

1. Scruggs CE. Reducing hazardous chemicals in consumer products: proactive company strategies. Journal of Cleaner Production. 2013;44:105-114.
2. UN Environment Programme. Global Chemicals Outlook II. From Legacies to Innovative Solutions: Implementing the 2030 Agenda for Sustainable Development. 2019.
3. International Living Future Institute. The Red List. https://living-future.org/declare/declare-about/red-list/. Published 2020.
4. Cradle to Cradle Products Innovation Institute. Basic Level Restricted Substances List (RSL). https://www.c2ccertified.org/resources/detail/cradle-to-cradle-certified-restricted-substances-list. Published 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

5. U.S. Green Building Council. Building Product Disclosure and Optimization - Material Ingredients. https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthc-189. Published 2018.
6. Cradle to Cradle Products Innovation Institute. What is Cradle to Cradle Certified™? Published 2020.
7. International Living Future Institute. Living Product Challenge. https://living-future.org/lpc/. Published 2020.
8. Global Green Tag Intl. PTY Ltd. Product Health Declaration™ - The PHD Tool. https://www.globalgreentag.com/get-certified/product-health-declaration-the-phd-tool/. Published 2021.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X09 WASTE MANAGEMENT | O (MAX : 1 PT)

Intent : Mitigate environmental contamination and associated exposure to hazards present in certain wastes.

Summary : This WELL feature requires the safe management and minimization of wastes associated with hazardous chemicals present in commonly used products.

Issue : Some products may create hazardous waste if handled, transported or disposed of in an uncontrolled manner, increasing risks of exposure to contaminants released to the environment. For instance, unmanaged products containing mercury and other heavy metals may expose people to elevated toxic metals through soil, air and water.[1,2] Leftover pesticides that have become obsolete or otherwise unusable may be disposed in general-purpose dumps, and improper disposal can result in physical injury, environmental pollution and land degradation.[3] Finally, electronic waste, if not properly handled, may create significant health effects downstream. [4]

Solutions : A protocol for handling and minimizing hazardous wastes, which involves separation of hazardous from other solid wastes and procuring adequate receptors for recycling or final disposal, can help mitigate chemical pollution and associated health concerns. By raising awareness and properly managing hazardous wastes, as well as by selecting products that are easier to reuse and have a lower impact on human health, projects may minimize the generation of such wastes and the release of hazardous materials into the environment.

PART 1 IMPLEMENT A WASTE MANAGEMENT PLAN (MAX : 1 PT)

For All Spaces:

For all batteries, pesticides, lamps that may contain mercury, other mercury-containing equipment (including thermostats and thermometers),[5] and electrical and electronic equipment[6] present or expected to be present within the project during the building operations, a waste management plan that contains the following is developed and implemented:

a. Identification of roles, responsibilities and vendors for implementing the plan.[7]
b. Identification of the sources of waste, estimation of rates of generation and strategies to minimize waste generation.[7]
c. Strategies for waste collection. Each of the categorized wastes is separately contained in clearly labeled receptacles and removed from the building within one year.[5]
d. Protocols for cleaning spills of mercury (including broken fluorescent lamp tubes), pesticides and battery electrolyte fluid, including sealed containment of residues, as applicable.[5]
e. Protocols to track, measure and report waste stream flows.[7]
f. Protocols for off-site shipment of wastes.

REFERENCES

1. UNEP DTIE Chemicals Branch World Health O. Guidance for Identifying Populations at Risk From Mercury Exposure. 2008.
2. World Health Organization. Waste and human health: Evidence and needs. 2015.
3. United Nations Development Programme. Chemicals and Waste Management for Sustainable Development. 2015. 978-92-807-3177-4.
4. Grant K, Goldizen FC, Sly PD, et al. Health consequences of exposure to e-waste: a systematic review. The Lancet Global Health. 2013;1(6):e350-e361.
5. U.S. Environmental Protection Agency. Standards for Universal Waste Management. In: U.S. Environmental Protection Agency, ed. Vol 40 CFR 2732012.
6. European Parliament and the Council of the European Union. Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE). In: Union E, ed. 2012/19/EU. Vol 2012/19/EU2012.
7. Bill Conley SJ. Sustainability How-to Guide – Waste Stream Management. International Facility Management Association;2016.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X10 PEST MANAGEMENT AND PESTICIDE USE | O (MAX : 1 PT)

Intent : Reduce the presence of pests in buildings primarily through integrated pest management (IPM) principles, favoring non-toxic pest control and the use of pesticides less hazardous to humans.

Summary : This WELL feature requires using IPM for pest control to reduce the application of pesticides and, when necessary, select low-hazard pesticides accompanied by signage detailing pesticide information at the site of application.

Issue : The presence of pests in crops, gardens and buildings has deleterious effects to the environment, our food supply and our health. While pesticides are tailored to address many problematic weeds, fungi, insects and rodents, exposure to specific pesticides may present danger to human health. For instance, studies have shown increased likelihood of cancer in children[1] and breast cancer[2], as well as birth defects upon maternal exposure to certain compounds. [3]

Solutions : Biological or chemical pesticides should only be used when absolutely necessary. Pesticide use, and associated risks, can be reduced through the application of IPM[4], which involves a decision-making process for the identification of pests, an understanding of the triggers that drive infestation, and the establishment of cultural, physical and educational barriers against their ingress.[5-7] When pesticides are needed, those deemed more protective of human health are preferred along with signage detailing pesticide information at the site of application providing further safeguard.

PART 1 MANAGE PESTS (MAX : 1 PT)

For All Spaces:

Option 1: Pest management development and implementation

A management plan for pest control based on integrated pest management (IPM) principles is implemented for all indoor and outdoor spaces, addressing the following:

a. Plan contains the following elements:[5-7]
    1. List of roles and responsibilities for the program development, implementation, maintenance and education.
    2. Pest management objectives, including protocols for identification of pests and metrics of progress.
    3. Design and operational measures to prevent conditions that may attract pests (e.g., access to food, water, harborage and entrance through the building envelope).
    4. Pest tolerance thresholds and control strategies (including methods and response times) for when tolerance thresholds are exceeded, attending to the safety of the applicator, the occupants and the environment.
    5. Records of pest monitoring data, pest events, pesticide applications, control actions and emergency responses.
b. Each pesticide used for periodic (i.e., non-emergency) application is listed in the plan and meets one of the following:
    1. Evaluated through the City of San Francisco Pesticide Hazard Screening Protocol with a Hazard Tier ranking of 3 (least hazardous).[8]
    2. Listed in the most recent version of the City of San Francisco's Reduced Risk Pesticide List as directed in the list (including limitations).[9]
    3. All active substances catalogued as 'low-risk' in the EU Pesticides Database.[10]
    4. All active substances are marked as "Approved" in the EU Pesticides Database[10] and are either classified as Class U or not classified in the latest version of "The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification."[11]
c. For pesticide application (periodic or emergency) within the project, the plan includes the following provisions:[12]
    1. Paper or digital notification to all building occupants on the protocol for pesticide use.
    2. Notification to all building occupants at least 24-hours prior to pesticide application, and signage posted at the site of application at least 24-hours prior to application until at least 24 hours after application.
    3. Notifications include the pesticide name, registration number, treatment location and date of application and applicator. If emergency pesticide application is needed, information on the type of emergency or reason for unplanned use.
d. The effectiveness of the plan is evaluated on an annual basis.[12]
e. The plan, records of its implementation, Safety Data Sheets (SDSs) of pesticides and results of inspections are available to occupants and owners.

OR

Option 2: Certified pest management

The project retains a service to implement and maintain an Integrated Pest Management (IPM) program, accredited under one of the following:

a. GreenShield Certification for pest management companies.
b. GreenPro Service Certification.
c. EcoWise Certification.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

d. CEPA Certification.

REFERENCES

1. Chen M, Chang C, Tao L, Lu CS. Residential Exposure to Pesticide During Childhood and Childhood Cancers: A Meta-Analysis. Pediatrics. 2015;136(4):719-729.
2. Tayour C, Ritz B, Langholz B, et al. A case–control study of breast cancer risk and ambient exposure to pesticides. Environmental Epidemiology. 2019;3(5):e070.
3. Rappazzo KM, Warren JL, Meyer RE, et al. Maternal residential exposure to agricultural pesticides and birth defects in a 2003 to 2005 North Carolina birth cohort. Birth Defects Research Part A: Clinical and Molecular Teratology. 2016;106(4):240-249.
4. Kass D, McKelvey W, Carlton E, et al. Effectiveness of an Integrated Pest Management Intervention in Controlling Cockroaches, Mice, and Allergens in New York City Public Housing. Environmental Health Perspectives. 2009;117(8):1219-1225.
5. San Francisco Department of the Environment ICC. Pest Prevention by Design. Authoritative Guidelines for Designing Pests Out of Structures. 2012.
6. U.S. Environmental Protection Agency. Integrated Pest Management in Buildings. 2011.
7. Maley M, Taisey A, Koplinka-Loehr C. Integrated Pest Management: A Guide for Affordable Housing. Northeastern IPM Center;2014.
8. Pesticide Research Institute. Database Tools. https://www.pesticideresearch.com/site/overview/tools/. Accessed Accessed January 16, 2020., 2020.
9. San Francisco Commission on the Environment. San Francisco Reduced-Risk Pesticide List for City-owned properties. San Francisco Government. https://sfenvironment.org/download/2017-reduced-risk-pesticide-list. Published 2019. Accessed January 24, 2020.
10. European Commission. EU - Pesticides Database. https://ec.europa.eu/food/plant/pesticides/eu-pesticides-database. Published 2016. Updated April 7, 2016. Accessed Accessed January 17, 2020, 2020.
11. World Health Organization. The WHO recommended classification of pesticides by hazard and guidelines to classification: 2009. 2009 ed2010.
12. U.S. Green Building Council. LEED O+M: Existing Buildings | v4.1 - LEED v4.1 Integrated pest management. https://www.usgbc.org/node/11600317. Published 2018. Accessed Accessed January 17, 2020, 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X11 CLEANING PRODUCTS AND PROTOCOLS | O (MAX : 2 PT)

Intent : Provide cleaning effectiveness by selecting less hazardous products and establishing adequate cleaning protocols and practices.

Summary : This WELL feature requires the restriction of hazardous or harmful ingredients in cleaning, disinfection and sanitization products, as well as the establishment of a cleaning plan, the maintenance of a cleaning schedule and a program training for staff.

Issue : Cleaning is fundamental for keeping a healthy indoor environment. Microorganisms such as house dust mites –ubiquitously present around the world– are directly related with asthma[1] and allergy[2] development. Surfaces may host pathogens present in feces and body fluids released by sick individuals, or through contact with another contaminated surface. [3] Beyond naturally-accumulating dust, commercial cleaning products may contain ingredients that may also degrade the indoor air quality and are suspected to be hazardous to human health.[4] Some products may emit substances that irritate the nose, eyes, throat and lungs and can cause or trigger asthma attacks. [5] Moreover, the interactions between cleaning agents, microbes and public health are diverse and complex[6,7], and we are just beginning to better understand them. [6] Cleaning practices may cause additional health concerns. For instance, indiscriminate use of cleaning sprays is suspected to be a risk factor for adult asthma.[8] Similarly, lack of education on the use of gloves during wet cleaning activities may explain the high prevalence of hand dermatitis in the cleaning service industry.[9,10]

Solutions : A thorough plan for cleaning operations that considers the health of occupants and cleaning staff increases the overall efficiency of the process, while reducing environmental damage.[11] The plan must align with advise from public health agencies for disinfection requirements. [12] Along personal protective equipment (PPE), the implementation of engineering controls (e.g., ventilation) and policies is key to reduce exposure to hazards during cleaning practices.[13] The provision of cleaning products that contain less hazardous ingredients may reduce the risk of respiratory and dermal symptoms.[8]

PART 1 IMPROVE CLEANING PRACTICES (MAX : 1 PT)

For All Spaces except Dwelling Units:

Option 1: Cleaning plan development and implementation

The project develops and implements a cleaning plan that meets the following requirements:

a. Details the following:[11]

1. Extent and frequency of cleaning.
2. Cleaning responsibilities of building occupants (if any) and cleaning staff.
3. Cleaning supplies and where they can be accessed.
4. Process to evaluate and document adherence to the cleaning plan.

b. Identifies the following:

1. Surfaces that require disinfection (e.g., high-touch surfaces).
2. Frequency and/or other thresholds (e.g., number of hours, number users of a space, results from a swab test) for disinfection.
3. Applicable governmental registration and directions of use (e.g., contact time and dilution rates) for disinfectants.
4. Other non-chemical tools used for disinfection, if any.

c. States the following documentation procedures:[11]

1. Record keeping practices for cleaning and disinfection activities.
2. The chain of communications with building occupants.
3. A system to log feedback from occupants and cleaning staff.

d. Specifies the following for cleaning materials and personal protection equipment (PPE):

1. PPE requirements for general cleaning and specialized tasks (e.g., disinfection or dilution or chemicals).
2. Color-coding for reusable and disposable cleaning cloths.
3. Separate cleaning of reusable cleaning materials from other clothing or products.

e. Includes the following precautions for storage of cleaning products:

1. An identifiable, fit-for-purpose storage space in accordance with the manufacturers' directions; bleach stored away from other products.
2. Color-coding and labeling of any bleach-based and ammonia-based products, indicating they are not to be mixed with one another.

f. Specifies the following for cleaning tools and equipment:

1. HEPA rated filters for vacuum cleaners.[1]
2. If carpet and woven upholstery are present, the cleaning methodology (based on manufacturer's recommendations), favoring hot water extraction if technically feasible.
3. Protocols for cleaning, maintenance and handling of waste accumulated in equipment (e.g., used vacuum cleaner bags).

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

g. Includes the following operational aspects:
    1. Use of cleaning and disinfection products, including dilutions (when needed) and ventilation requirements.
    2. On-site availability of current Safety Data Sheets (SDS) of cleaning and disinfection products, in languages spoken by the cleaning staff.
    3. Precautions to avoid slip hazards during and after floor cleaning.
    4. Safe disposal of waste, including soiled cleaning materials and PPE.
h. Outlines a training program that meets the following:
    1. Training covers cross-contamination prevention via hand hygiene, PPE, cleaning cloth replacement, cloth handling techniques and carrying systems to separate clean tools from dirty ones.
    2. Training is delivered to all relevant personnel including building management, building operators and contracted cleaning staff, on an annual basis, and whenever protocols change.

OR

Option 2: Certified cleaning provider

The project or organization retains a cleaning provider certified under one of the following standards:

a. Green Seal® Standard for Commercial and Institutional Cleaning Services, GS-42, operated by Green Seal Inc.[18]
b. Cleaning Industry Management Standard (CIMS) - GB criteria, operated by ISSA.[19]
c. Nordic Swan Ecolabelling for Cleaning Services criteria, operated by Nordic Ecolabelling. [20]
d. British Institute of Cleaning Science (BISc) accredited training.

PART 2 SELECT PREFERRED CLEANING PRODUCTS (MAX : 1 PT)

For All Spaces except Dwelling Units:

The project or organization has a cleaning policy that lists all surface cleaning and disinfection products and specifies that they meet the following requirements:

a. Cleaning products as-sold meet one of the following:
    1. Are labeled as 'low-hazard' or 'safer' by an ISO Reference,[14] or by a third-party certification recognized by the local government where the building is located.
    2. Have ingredients disclosed through a Safety Data Sheet (SDS) that meets EU Regulation 2015/830 (CLP),[15] or through a disclosure document that meets California State Bill No. 258, and there are no ingredients listed in the disclosure document present at 100 ppm (0.01%) or above that are classified with the following codes and hazard statements as defined by the Globally Harmonized System (GHS): H311, H312, H317, H334, H340, H350, H360, H372.
    3. Meet Feature X08 Materials Optimization.
b. Products labeled as disinfectants meet the following:
    1. Have all antimicrobial efficacy claims registered by a governmental office and stated in their label.
    2. Utilize only active ingredients only from the following list: citric acid, hydrogen peroxide, L-lactic acid, ethanol, isopropanol, peroxyacetic acid, sodium bisulfate, chitosan.
    3. Section 2 of the SDS does not contain the following GHS codes: H311, H312, H317, H334, H340, H350, H360, H372.

REFERENCES

1. Wu F, Takaro Tim K. Childhood Asthma and Environmental Interventions. Environmental Health Perspectives. 2007;115(6):971-975.
2. Calderón MA, Linneberg A, Kleine-Tebbe J, et al. Respiratory allergy caused by house dust mites: What do we really know? Journal of Allergy and Clinical Immunology. 2015;136(1):38-48.
3. Boone SA, Gerba CP. Significance of Fomites in the Spread of Respiratory and Enteric Viral Disease. Applied and Environmental Microbiology. 2007;73(6):1687.
4. Garza JL, Cavallari JM, Wakai S, et al. Traditional and environmentally preferable cleaning product exposure and health symptoms in custodians. American Journal of Industrial Medicine. 2015;58(9):988-995.
5. Occupational Safety Health Administration, National Institute for Occupational Safety Health. Protecting Workers Who Use Cleaning Chemicals. 2012.
6. Velazquez S, Griffiths W, Dietz L, et al. From one species to another: A review on the interaction between chemistry and microbiology in relation to cleaning in the built environment. Indoor Air. 2019;29(6):880-894.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

7. Zhong L, Su F-C, Batterman S. Volatile Organic Compounds (VOCs) in Conventional and High Performance School Buildings in the U.S. International Journal of Environmental Research and Public Health. 2017;14(1).
8. Zock J-P, Plana E, Jarvis D, et al. The Use of Household Cleaning Sprays and Adult Asthma. American Journal of Respiratory and Critical Care Medicine. 2007;176(8):735-741.
9. Jungbauer FHW, Van Der Harst JJ, Schuttelaar ML, Groothoff JW, Coenraads PJ. Characteristics of wet work in the cleaning industry. Contact Dermatitis. 2004;51(3):131-134.
10. Behroozy A, Keegel TG. Wet-work Exposure: A Main Risk Factor for Occupational Hand Dermatitis. Safety and Health at Work. 2014;5(4):175-180.
11. ASTM International. ASTM E1971-19. Standard Guide for Stewardship for the Cleaning of Commercial and Institutional Buildings. In: ASTM International, West Conshohocken, PA; 2019.
12. World Health Organization. Cleaning and disinfection of environmental surfaces in the context of COVID-19. https://www.who.int/publications/i/item/cleaning-and-disinfection-of-environmental-surfaces-inthe-context-of-covid-19. Published 2020. Updated May 16, 2020. Accessed June 25, 2020.
13. Gorman T, Dropkin J, Kamen J, et al. Controlling Health Hazards to Hospital Workers: A Reference Guide. NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy. 2014;23(1_suppl):1-169.
14. Global Ecolabelling Network. Ecolabelling Standards by Product Category. https://globalecolabelling.net/eco/eco-friendly-products-by-category/. Published 2020. Accessed January 31, 2020.
15. European Parliament and the Council of the European Union. Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). In. L 132/8. Vol 2015/830/EU: Official Journal of the European Union; 2015.
16. State of California. SB-258 Cleaning Product Right to Know Act of 2017. In. SB-258. Sacramento, California2017.
17. National Library of Medicine. GHS Classification. https://pubchem.ncbi.nlm.nih.gov/ghs/. Published 2019. Accessed January 24, 2020.
18. Green Seal Inc, Green Seal® Standard for Commercial and Institutional Cleaning Services, GS-42, Edition 2.3, https://greenseal.org/wp-content/uploads/GS-42-Standard-Ed-2.3-07.2021.pdf
19. GBAC, GBAC STAR Service Accreditation, https://gbac.issa.com/gbac-star-service-accreditation/.
20. Nordic Swan Ecolabel. Cleaning Services 076. https://www.nordic-swan-ecolabel.org/criteria/cleaning-services-076/. Accessed November 8, 2023

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X12 CONTACT REDUCTION | O (MAX : 2 PT)

Intent : Implement strategies to reduce human contact with respiratory particles and surfaces that may carry pathogens.

Summary : This WELL feature requires projects to implement design and policy strategies to minimize some instances of contact with contaminated respiratory particles, as well as reduce the number of surfaces that are necessary to touch.

Issue : Many viral diseases, including COVID-19[1] and influenza,[2] are spread by oral or respiratory emissions of liquid particles emitted by an infected person when they cough, sneeze or even exhale.[3] Factors that may affect exposure include the size distribution of the respiratory particles, [2] humidity,[4,5] air flow[5,6] and air treatment.[5,6] While the relative influence of these factors is variable, direct exposure to particles shed by an infected individual may increase a person's odds of acquiring certain diseases.[1,7] Respiratory and fecal particles can reach surfaces either by direct deposition from the source (e.g., coughing on a surface) or indirectly through hands. On inanimate contaminated surfaces (called fomites), pathogens may survive for a number of hours or even days.[8,9] Pathogens may spread from these surfaces when touched, potentially infecting people through oral or nasal exposure. [10] Fomites have been linked to disease transmission for many common viral pathogens, including rotaviruses – the most common cause of children's diarrhea in the world – and adenoviruses, and have been associated with some strains of coronaviruses.[10,11]

Solutions : Implementing design and policy strategies aimed at reducing exposure to some particles shed by infected individuals, like establishing physical distancing among people [12,13] or providing physical barriers to prevent respiratory particles from spreading,[14] may slow the spread of pathogens.[15] Reimagining spaces to reduce the number of surfaces a person needs to touch, as well as implementing enhanced hygiene protocols for high-touch surfaces, may reduce the risk of pathogen transmission.[16,17]

PART 1 B REDUCE RESPIRATORY PARTICLE EXPOSURE (MAX : 1 PT)

For All Spaces except Dwelling Units:

1: Contact reduction cues

The following requirements are implemented during periods when higher incidence of respiratory disease is likely:

a. At least one of the following distancing strategies:
    1. Queuing marks to increase distance between people while waiting in line (e.g., in elevator lobbies, at check-out counters) and while using moving sidewalks and escalators, as applicable.
    2. Screens, protective furnishings or other engineering controls to reduce particle exchange at security check-ins, reception areas, check-out counters and other places with frequent interaction between occupants and a stationary worker.
    3. Self-service systems to control ingress or egress to the project (e.g., at reception desks or checkout counters).
b. At least one of the following circulation strategies:
    1. One-way hallways and corridors.
    2. Separate entry and exit doors at pedestrian building entrances.
    3. Separate entry and exit for restrooms except single-user bathrooms.

2: Contact reduction policies

The following requirements are implemented during periods when higher incidence of respiratory disease is likely:

a. All of the following in any shared spaces (e.g., meeting rooms, workspaces, communal kitchens):
    1. Strategies to increase distance among occupants.
    2. Expectations and requirements for usage of face coverings or personal protective equipment.
    3. Clearly communicated rules for occupancy to reduce respiratory particle exposure and rationale for their use.
b. The project or organization implements at least one of the following communication strategies to educate occupants about the practices implemented by the project to reduce respiratory particle exposure:
    1. Monthly communication (e.g., email, webcast) to all regular occupants.
    2. Prominent signage (physical or digital) at all building entrances and in shared spaces.

Note :
Interiors projects may count base building elevators, entries and exits towards feature requirements, even if outside of the project boundary.

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 2 ADDRESS SURFACE HAND TOUCH (MAX : 1 PT)

For All Spaces except Dwelling Units & Guest Rooms:

1: Surface touch management

The following requirements are met:

a. Project offers hands-free operation (through foot, voice, sensor or personal electronic device) or implements other design strategies to avoid hand operation for at least three of the following:
    1. Regularly used pedestrian doors to the project, during regularly occupied hours.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

2. Elevators.
3. All water bottle fillers, water faucets, soap and paper towel dispensers.
4. Window blinds and indoor lighting switches and/or controllers.
5. Lids of trash, recycling and reuse bins.

b. Project supports occupants in maintaining hand hygiene near the following high-touch surfaces:
   1. Handrails, handlebars and other structures that support mobility and accessibility.
   2. Surfaces designed to help individuals with physical and/or visual disabilities fully utilize a space (e.g., push to open door buttons, wheelchair lift controls, tactile maps or signage).

c. Project establishes and communicates rules and expectations for the usage and cleaning of shared tools and devices (e.g., photocopiers, gym equipment, communal kitchen appliances, utensils) for all regular occupants.

REFERENCES

1. Chu DK, Akl EA, Duda S, et al. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. The Lancet. 2020;395(10242):1973-1987.

2. Kutter JS, Spronken MI, Fraaij PL, Fouchier RAM, Herfst S. Transmission routes of respiratory viruses among humans. Current Opinion in Virology. 2018;28:142-151.

3. Yan J, Grantham M, Pantelic J, et al. Infectious virus in exhaled breath of symptomatic seasonal influenza cases from a college community. Proceedings of the National Academy of Sciences. 2018;115(5):1081.

4. Yang W, Elankumaran S, Marr LC. Relationship between Humidity and Influenza A Viability in Droplets and Implications for Influenza's Seasonality. PLOS ONE. 2012;7(10):e46789.

5. Engineering NAo, National Academies of Sciences E, Medicine. Microbiomes of the Built Environment: A Research Agenda for Indoor Microbiology, Human Health, and Buildings. Washington, DC: The National Academies Press; 2017.

6. Dai D, Prussin AJ, Marr LC, Vikesland PJ, Edwards MA, Pruden A. Factors Shaping the Human Exposome in the Built Environment: Opportunities for Engineering Control. Environmental Science & Technology. 2017;51(14):7759-7774.

7. van Beek J, de Graaf M, Al-Hello H, et al. Molecular surveillance of norovirus, 2005–16: an epidemiological analysis of data collected from the NoroNet network. The Lancet Infectious Diseases. 2018;18(5):545-553.

8. Otter JA, Donskey C, Yezli S, Douthwaite S, Goldenberg SD, Weber DJ. Transmission of SARS and MERS coronaviruses and influenza virus in healthcare settings: the possible role of dry surface contamination. Journal of Hospital Infection. 2016;92(3):235-250.

9. Abad FX, Pintó RM, Bosch A. Survival of enteric viruses on environmental fomites. Applied and Environmental Microbiology. 1994;60(10):3704.

10. Boone SA, Gerba CP. Significance of Fomites in the Spread of Respiratory and Enteric Viral Disease. Applied and Environmental Microbiology. 2007;73(6):1687.

11. Mayo Clinic. Rotavirus. https://www.mayoclinic.org/diseases-conditions/rotavirus/symptoms-causes/syc-20351300. Published 2019. Updated May 12, 2019. Accessed August 11, 2020.

12. Valdez LD, Macri PA, Braunstein LA. Intermittent social distancing strategy for epidemic control. Physical Review E. 2012;85(3):036108.

13. Chaudhuri S, Basu S, Kabi P, Unni VR, Saha A. Modeling the role of respiratory droplets in Covid-19 type pandemics. Physics of Fluids. 2020;32(6):063309.

14. Verma S, Dhanak M, Frankenfield J. Visualizing the effectiveness of face masks in obstructing respiratory jets. Physics of Fluids. 2020;32(6):061708.

15. Ahmed F, Zviedrite N, Uzicanin A. Effectiveness of workplace social distancing measures in reducing influenza transmission: a systematic review. BMC Public Health. 2018;18(1):518.

16. Bhatta DR, Hamal D, Shrestha R, et al. Bacterial contamination of frequently touched objects in a tertiary care hospital of Pokhara, Nepal: how safe are our hands? Antimicrobial Resistance & Infection Control. 2018;7(1):97.

17. Zimring C, Denham ME, Jacob JT, et al. The Role of Facility Design in Preventing Healthcare-Associated Infection: Interventions, Conclusions, and Research Needs. HERD: Health Environments Research & Design Journal. 2013;7(1_suppl):127-139.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

X13 B FAIR LABOR IN BUILDING PRODUCTS | O (MAX : 3 PT)

Intent : Accelerate the elimination of modern slavery by selecting building products from manufacturers that advance and verify fair labor rights across their facilities and in their supply chains.

Summary : This WELL feature requires the selection of building products from manufacturers that verify that fair labor practices are implemented at their manufacturing facilities and across their supply chains.

Solutions : Around the globe, people are tricked or forced into exploitative situations that they cannot refuse or leave, suffering what is collectively known as modern slavery conditions. [1] Not counting commercial sexual exploitation, an estimated 21.2 million people (of which 13 million were children) were subject to forced labor exploitation in 2021.[2] Products used in the construction of real estate are significant contributors to this problem.[3] Due to the complexity and obscurity of supply chains, it can be nearly impossible to identify products and materials that are "slavery-free."[3]

Impact : Creating demand for "slavery-free" products, in addition to aiding in the elimination of forced labor and the worst forms of child labor, can steer the market towards making fair labor practices the baseline across the building products industry.[3] As one of the main contributors of decent work,[4] provision of a living wage is likely to improve workers' physical and mental health and has the potential of breaking the poverty cycle.[5] Going deeper into the supply chain, several certification bodies assess and certify good labor practices during the extraction and processing of common raw building materials such as cement, steel and copper. Finally, companies can assess labor conditions within their own facilities and across their own supply chains through third-party audits and/or the achievement of relevant certifications.

PART 1 SELECT PRODUCTS FROM MANUFACTURERS THAT PROVIDE LIVING WAGES (MAX : 1 PT)

For All Spaces:

For at least five manufacturers of products from the product classes listed in Appendix X1, one the following is provided:

a. Manufacturer's proof of accreditation provided by one of the following organizations:
    1. SAI (Social Accountability International) Reference, administered by Social Accountability Accreditation Services (SAAS).[6]
    2. Any certification from the Reference.[7]
    3. A living wage certification from a member of the Reference.[8]
b. Manufacturer's public statement disclosing the living wage provision that includes the following:
    1. How a living wage is provided to all people (including contractors) who work in the manufacturer's facilities.
    2. How the living wage is determined and regularly updated.
    3. How organization-wide compliance with the living wage provision is confirmed, including metrics used to measure compliance.

Note :
This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 2 SELECT PRODUCTS WITH CERTIFIED RAW MATERIALS (MAX : 1 PT)

For All Spaces:

For at least ten products from the product classes listed in Appendix X1, each made by a distinct manufacturer, one of the following is met:

a. Has one of the following:
    1. A Reference with a Silver, Gold or Platinum Social Fairness level.[9]
    2. Any Reference that includes criteria for "Minimum Entitlement including Wages," "Workplace Health and Safety," and "Modern Slavery and Human Rights including Labor Rights".[10]
    3. A Reference.[11]
b. For products containing materials listed in Appendix X2, each of those materials (up to a maximum of five materials per product) meet one of the following:
    1. Is certified under one of the applicable standards listed in Appendix X2.
    2. Is supplied by a manufacturer that meets Part 1 of this feature.

Note :
This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 3 SELECT MANUFACTURERS WITH TRANSPARENCY IN SUPPLY CHAIN PRACTICES (MAX : 1 PT)

For All Spaces:

For at least five manufacturers of products from the product lasses listed in Appendix X1, one of the following is met:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

a. The manufacturer is a Full Member of the Reference.

b. The manufacturer has made a public statement disclosing the following:

    1. Confirmation that at least five of the manufacturer's suppliers (or 5%, whichever is greater) have been assessed for labor conditions by third-party auditors.[13,14]
    2. Confirmation that the audits were based on semi-announced visits to the manufacturer's supplier facilities.[15]
    3. The audit criteria, sampling methodology and relevant metrics of compliance.
    4. Confirmation that the facilities were found in compliance with local regulation and the following principles:[16]
        1. Workers' freedom of movement.
        2. Workers' freedom of association and collective bargaining.
        3. Forced labor.
        4. Working hours and remuneration.
        5. Occupational health and safety.
        6. Worst forms of child labor.
        7. Sexual harassment.

Note :

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. Walk Free, Reference. Accessed on October 23, 2024
2. International Labour Organization (ILO), Walk Free, and International Organization for Migration (IOM), Global Estimates of Modern Slavery: Forced Labour and Forced Marriage, Geneva, 2022. Reference
3. Grace Farms Foundation, Design for Freedom, Prince, S., C.deBaca, L., and Thatcher, C., eds. New Canaan, CT, 2020. Reference
4. Seubert, C., Hopfgartner, L., & Glaser, J. (2021). Living wages, decent work, and need satisfaction: an integrated perspective. European Journal of Work and Organizational Psychology, 30(6), 808–823. Reference
5. Searle, R. H., & McWha-Hermann, I. (2020). "Money's too tight (to mention)": a review and psychological synthesis of living wage research. European Journal of Work and Organizational Psychology, 30(3), 428–443. Reference
6. Social Accountability International, Reference. Accessed October 28th, 2024.
7. Living Wage Foundation, Reference Accessed October 28th, 2024.
8. Living Wage Foundation, Global Living Wage Network, Reference. Accessed October 28th, 2024.
9. Cradle to Cradle Products Innovation Institute, Reference. Accessed October 28th, 2024.
10. Good Environmental Choice Australia, Reference. Accessed October 28th, 2024.
11. Global Green Tag, Modern Slavery Declaration - the Global GreenTag International MSD™, https://www.globalgreentag.com/msd-program.html
12. GreenCircle Certified, Multi-Attribute Optimization, https://www.greencirclecertified.com/slf. Accessed October 28th, 2024.
13. Suprun, E., R. AlMeshari, T. Liu, R. A. Stewart, and S. Duran. Beyond Compliance in the Construction Sector: Mapping the Modern Slavery Statements through Content Analysis. IOP Conference Series: Earth and Environmental Science 1101, no. 3 (2022/11/01 2022): 032018. https://dx.doi.org/10.1088/1755-1315/1101/3/032018.
14. Benstead, A. V., Hendry, L. C., & Stevenson, M. (2020). Detecting and remediating modern slavery in supply chains: a targeted audit approach. Production Planning & Control, 32(13), 1136–1157. https://doi.org/10.1080/09537287.2020.1795290.
15. Scott, P. Audit Requirements for Accredited Certification Bodies for the SA8000 Program v.4.2. SAI International. https://sa-intl.org/wp-content/uploads/2021/10/SAAS_Procedure_200_v-4.2_March.2020.pdf
16. International Labor Organization (ILO), NORMLEX Information System on International Labour Standards. https://normlex.ilo.org/dyn/normlex/en/f?p=1000:12000. Accessed October 28th, 2024.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

APPENDIX X1:

The following denominations for product classes apply throughout the Materials concept:

1. Millwork and fixtures: Built-in cabinetry/bespoke joinery, countertops, window treatments (e.g., curtains, blinds) and window films. Does not include beddings, pillows, artwork, rugs and appliances.
2. Ceiling and wall finishes: Ceiling and wall planks and tiles, acoustical treatments, wall bases and wallcoverings including wallpaper.
3. Electrical and electronic products: Cables, electrical boxes; tubing and conduit; fire alarm notification and initiating devices (e.g., strobes, pull stations); environmental, HVAC, occupancy and motion sensors and meters; and relays, thermostats and load break switches.
4. Flooring: Carpeting, resilient flooring (e.g., sheet, tiles) and any other natural or engineered floor covering product, including finished poured flooring.
5. Furniture: Movable objects intended to support various human activities such as seating (e.g., chairs, stools, sofas), eating or working (e.g., tables, desks, workstations), and sleeping (e.g., beds). Also includes objects for holding and storage such as chests, shelves, bookcases, file cabinets and cabinetry (except custom-made or built-in), and space separations such as freestanding partition panels.
6. Interior doors and windows, including door casings.
7. Insulation: Thermal and acoustic insulation in walls and ceilings. Unless explicitly stated, this class excludes duct, tube and pipe insulation.
8. Wet-applied products: Paints, adhesives, sealants, coatings and finished poured flooring.
9. Demountable Wall Partitions: Permanently installed wall systems that are designed to be relocated without damage to the product.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

APPENDIX X2:

The table below lists eligible certifications by type of material.

Material	Relevant Certifications	Scope*
Copper	The Copper Mark Certification	Upstream supply chain
	Responsible Mineral Initiative	Product and Upstream supply chain
Steel and Iron	LME (London Metal Exchange) Responsible Sourcing	Extracting/Farming
	Initiative for Responsible Mining Assurance Standard	Extracting/Farming
	LME (London Metal Exchange) Responsible Sourcing	Extracting/Farming
	Responsible Minerals Initiative	Product and Upstream supply chain
	Responsible Steel Certification	Product and Upstream supply chain
Aluminum	Aluminum Stewardship Initiative (ASI) Chain of Custody Standard	Product
	Aluminum Stewardship Initiative (ASI) Performance Standard	Upstream supply chain
Stone	Ethical Stone Register	Upstream supply chain
	Fair Stone Standard	Upstream supply chain
	XertifiX Standard-Label	Extracting/Farming and Upstream supply chain
Mica, Gypsum, and Silica	Initiative for Responsible Mining Assurance Standard	Extracting/Farming
	Responsible Mica Initiative	Extracting/Farming and Upstream supply chain
	Responsible Minerals Initiative (conformant facilities)	Product and Upstream supply chain
Concrete	Concrete Sustainability Council Certification	Product and Upstream supply chain
Timber	American Tree Farm System (ATFS)	Upstream supply chain
	Programme for the Endorsement of Forest Certification (PEFC)	Extracting/Farming and Upstream supply chain
	Sustainable Forestry Initiative (SFI)	Product, Upstream supply chain and Extracting/Farming
	Forest Stewardship Council (FSC) Chain of Custody Certification	Product, Upstream supply chain and Extracting/Farming
Textiles	Better Cotton	Product and Extracting/Farming
	Fairtrade Cotton Mark	Product and Upstream supply chain
	Fairtrade Textile Standard	Product and Upstream supply chain
	FSC Certified Viscose	Product, Upstream supply chain and Extracting/Farming
	Global Organic Textile Standard	Product and Upstream supply chain
	Good Weave	Product and Upstream supply chain
	Responsible Wool Standard	Extracting/Farming
	STeP by Oeko-Tex	Upstream supply chain
	Global Recycle Standard	Product and Upstream supply chain
Leather	STeP by Oeko-Tex	Upstream supply chain

*Certifications may be of the following scope

Product: voluntary standards established by independent, third-party groups relating to environmental, social, ethical, and product safety issues. These groups incur the cost and responsibility of certifying that products adhere to their standards and award a certification seal, or logo, that proves compliance.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Manufacturing: creation or production of goods with the help of equipment, labor, machines, tools, and chemical or biological processing or formulation.

Upstream Supply Chain: a network of individuals and companies involved in creating and delivering a product to the consumer. Links on the chain begin with the producers of the raw materials and end with the finished product to the end user.

Extracting/Farming: obtaining natural resources from the Earth's crust (or other sources), growing crops or raising livestock to use them for various purposes.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

MIND

The WELL Mind concept promotes mental health through policy, program and design strategies that seek to address various factors that influence cognitive and emotional well-being.

Mental health is a fundamental component of human health across all stages of life and is vital for the physical and social well-being of all individuals, communities and societies.[1] Mental health is not simply the absence of a mental health condition.[1] Rather, it is a state of well-being, in which individuals are able to live to their fullest potential, cope with the normal stresses of life, work productively and contribute to their community.[1] Mental health is determined by a range of socioeconomic, biological and environmental factors, such as work conditions, lifestyle and health behaviors.[1] Through a variety of interventions, the WELL Mind concept seeks to address and support these drivers of mental health with the goal of improving the cognitive and emotional health and well-being of those living, working, learning and spending time in built spaces.

Mental health and substance use conditions are a widespread global health concern. They collectively account for 13% of the global burden of disease and an estimated 32% of years lived with disability.[2] Alcohol and drug use contribute significantly to the global burden of premature death and disability, with alcohol alone accounting for 3.3 million deaths per year (or 6% of all deaths) and 5% of the global burden of disease.[3] Depression and anxiety disorders are among the leading causes of global burden of disease, ranking first and sixth, respectively.[4] Depression alone accounts for 4% of the global burden of disease and is considered to be among the largest causes of disability worldwide.[5]Overall, it is estimated that 14.3% of deaths worldwide (approximately eight million people per year) are attributable to mental health conditions.[6]

An estimated 18% of adults will experience a common mental health condition, such as anxiety, depression or substance abuse, over a 12-month period, and over 30% of adults will experience a mental health condition during their lifetime.[7]Approximately two-thirds of individuals experiencing common mental health conditions are employed.[8] The impact of mental health in the workplace is profound, with depression and anxiety alone costing the global economy an estimated $1 trillion due to lost productivity.[9]

Despite its enormous global impact, worldwide spending on mental health is less than $2 per person.[8] Although treatments for these conditions exist, they are often unavailable or vastly underutilized. In high-income countries, 35–50% of people living with mental health conditions receive no care or treatment.[1] This gap widens in low- and middle-income countries, where 76–85% of people living with mental health conditions do not receive necessary treatment.[1] If left unmanaged, mental health conditions – especially depression – can place an individual at risk for suicidal thoughts, attempted suicide and completed suicide. Suicide results in a tragic and preventable death, accounting for more than 800,000 deaths per year worldwide.[3]

It is increasingly recognized that a complex relationship exists between the mind and the body and that this interplay can significantly impact health and well-being. Mental and physical health impact each other across some of the most common chronic diseases, including HIV, cardiovascular disease and diabetes.[2] Furthermore, states of chronic stress are associated with increased risk of numerous adverse health consequences, such as depression, cardiovascular disease, diabetes and upper respiratory infection.[1] Depression alone is associated with an increased risk of disease, including diabetes, cancer, cardiovascular disease and asthma.[1] Due to the numerous ways in which mental health impacts physical health, people with mental health conditions experience a mortality rate 2.2 times higher than the general population and a median of 10 years of potential life lost.[6]

The built environment serves as a powerful tool to help mitigate these adverse mental health outcomes through policies, programs and design. Given the high prevalence of mental health conditions among the working population, the workplace is increasingly being seen as an important target for mental health promotion, prevention and interventions.[10] Organizations can promote mental health through a variety of strategies. These include improving mental health literacy and reducing stigma; providing healthy living and working conditions for all—such as fostering positive work environments and offering stress management programs; and supporting the availability and use of mental health, substance use, and addiction services and treatment.[5,11] Improving opportunities for restoration through mindfulness programming, restorative spaces and support of optimal sleep can also have a marked impact on physical and mental well-being, including relief from negative symptoms associated with anxiety, depression, pain and stress, as well as enhancements in overall perceived health.[12,13] Lastly, design strategies, such as increasing nature contact within built spaces, has been linked with numerous health promoting benefits, including decreased levels of depression and anxiety, increased attentional capacity, better recovery from job stress and illness, increased pain tolerance and increased psychological well-being.[14–16]

The WELL Mind concept promotes implementation of design, policy and programmatic strategies that support

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

cognitive and emotional health through a variety of prevention and treatment efforts. In combination, these interventions have the potential to positively impact the short- and long-term mental health and well-being of individuals of all backgrounds throughout a community.

Note : Read more about the evidence behind the WELL Mind Concept. Note: Material from the research digests is not covered on the WELL AP exam.

REFERENCES

1. World Health Organization. Mental health: strengthening our response. WHO. http://www.who.int/mediacentre/factsheets/fs220/en/. Published 2016. Accessed January 11, 2018.
2. Vigo D, Thornicroft G, Atun R. Estimating the true global burden of mental illness. The Lancet Psychiatry. 2016;3(2):171-178. doi:10.1016/S2215-0366(15)00505-2
3. World Health Organization. Global Status Report on Alcohol and Health. Geneva, Switzerland; 2014. doi:/entity/substance_abuse/publications/global_alcohol_report/en/index.html
4. World Health Organization. Depression and Other Common Mental Disorders: Global Health Estimates. Geneva; 2017. doi:CC BY-NC-SA 3.0 IGO
5. World Health Organization. Mental Health Action Plan 2013-2020. Geneva, Switzerland; 2013. doi:ISBN 978 92 4 150602 1
6. Reisinger E, McGee R, Druss B. Mortality in Mental Disorders and Global Disease Burden Implications: A Systematic Review and Meta-analysis. JAMA Psychiatry. 2015;72(4):334-341. doi:10.1001/jamapsychiatry.2014.2502.Mortality
7. Steel Z, Marnane C, Iranpour C, et al. The global prevalence of common mental disorders: a systematic review and meta-analysis 1980-2013. Int J Epidemiol. 2014;43(2):476-493. doi:10.1093/ije/dyu038
8. Jarman L, Martin A, Venn A, et al. Workplace health promotion and mental health: Three-year findings from partnering Healthy@Work. PLoS One. 2016;11(8):1-14. doi:10.1371/journal.pone.0156791
9. World Health Organization. Mental health in the workplace. WHO. http://www.who.int/mental_health/in_the_workplace/en/. Published 2017. Accessed January 10, 2018.
10. Hanisch SE, Twomey CD, Szeto ACH, Birner UW, Nowak D, Sabariego C. The effectiveness of interventions targeting the stigma of mental illness at the workplace: a systematic review. BMC Psychiatry. 2016;16(1):1. doi:10.1186/s12888-015-0706-4
11. World Health Organization. Mental Health in the Workplace. https://www.who.int/mental_health/in_the_workplace/en/. Published 2019. Accessed October 1, 2020.
12. Goyal M, Singh S, Sibinga EMS, et al. Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. JAMA Intern Med. 2014;174(3):357-368. doi:10.1001/jamainternmed.2013.13018.Meditation
13. Fritz C, Ellis AM, Demsky C a., Lin BC, Guros F. Embracing work breaks: Recovery from work stress. Organ Dyn. 2013;42(January):274-280. doi:10.1016/j.orgdyn.2013.07.005
14. Wolf K, Krueger S, Flora K. Work and Learning - A Literature Review. Green Cities Good Heal. 2014. www.greenhealth.washington.edu. Accessed January 12, 2018.
15. Larsen L, Adams J, Deal B, Kweon B-S, Tyler E. Plants in the workplace the effects of plant density on productivity, attitudes, and perceptions. Environ Behav. 1998;30(3):261-281.
16. Largo-Wight E, Chen WW, Dodd V, Weiler R. Healthy Workplaces: The Effects of Nature Contact at Work on Employee Stress and Health. Public Health Rep. 2011;126:124-131. doi:10.2307/41639273

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

M01 MENTAL HEALTH PROMOTION | P

Intent : Promote mental health and well-being through the provision of supportive programs, policies and resources.

Summary : This WELL feature requires projects to provide programs, policies and resources that support and promote occupant mental health.

Issue : Recent estimates indicate that common mental health conditions (e.g., anxiety, depression, substance use) are experienced by 18% of adults over a 12-month period, and 30% of adults over their lifetime.[1] Depression is the leading cause of disability in the world, and depression and anxiety alone cost the global economy an estimated $1 trillion due to lost productivity, yet global annual spending on mental health is less than $2 per person.[2,3] Failure to address mental health in the workplace can contribute to high turnover, presenteeism and absenteeism, repetitive recruitment and training costs, increased use of drug plans, disability claims, sick leave, employee assistance plans (EAPs) and other costly supports, increased accidents and injuries, and burnout.[4–6]

Solutions : Given the high prevalence of mental health conditions among the working population, the workplace is an important target for promotion, prevention and intervention efforts.[7,8] Strategies include increased organizational support, enhancement of mental health literacy and reduction of stigma, which have been shown to help people recognize signs of poor mental health and encourage help-seeking behavior.[8,9]Improving opportunities for restoration through mindfulness programming and optimal sleep can have a marked impact on mental well-being, including relief from negative symptoms associated with anxiety, depression, pain and stress, as well as enhancements in overall perceived health.[10–13]

PART 1 PROMOTE MENTAL HEALTH AND WELL-BEING

For All Spaces:

The following requirements are met:

a. At least two of the following are available to all employees and students at no additional cost:
    1. Education or awareness efforts on mental health and well-being, offered quarterly, either in-person or virtually (e.g., webcast on stress management, presentation on mindfulness, email on healthy sleep habits).[14,15]
    2. Trainings or courses related to mental health and well-being, offered annually, either in-person or virtually (e.g., Mental Health First Aid, stress management training).[14,15]
    3. Mindfulness or restorative programming, offered weekly, either in-person or virtually (e.g., ongoing access to guided meditation application, weekly yoga classes).[7]
    4. Policy that establishes healthy working hours, outlining the maximum hours to be worked per 24-hour and seven-day period.[16]
    5. Dedicated space for restoration and relaxation, with an accompanying policy permitting breaks during work or school hours.[16,17]
b. Annual communication (e.g., email, online module, in-person training) is provided to all employees and students, and onboarding communications are provided to all new employees and students, specifically addressing all mental health and well-being benefits, resources and programs available through the project or organization.

Note : Projects may achieve points in optimizations that overlap with strategies listed in Part 1.a.

REFERENCES

1. Jarman L, Martin A, Venn A, et al. Workplace health promotion and mental health: Three-year findings from partnering Healthy@Work. PLoS One. 2016;11(8):1-14. doi:10.1371/journal.pone.0156791
2. World Health Organization. Mental Health Action Plan 2013-2020. Geneva, Switzerland; 2013. doi:ISBN 978 92 4 150602 1
3. World Health Organization. Mental health in the workplace. WHO. http://www.who.int/mental_health/in_the_workplace/en/. Published 2017. Accessed January 10, 2018.
4. Mood Disorders Society of Canada. Workplace Mental Health. Canada; 2014.
5. Jorm AF. Mental health literacy; empowering the community to take action for better mental health. Am Psychol. 2012;67(3):231-243. doi:10.1037/a0025957
6. World Health Organization. Burn-out an "occupational phenomenon": International Classification of Diseases. https://www.who.int/mental_health/evidence/burn-out/en/. Published 2019. Accessed August 8, 2019.
7. Centers for Disease Control and Prevention. Mental Health in the Workplace.; 2018.
8. Hanisch SE, Twomey CD, Szeto ACH, Birner UW, Nowak D, Sabariego C. The effectiveness of interventions targeting the stigma of mental illness at the workplace: a systematic review. BMC Psychiatry. 2016;16(1):1. doi:10.1186/s12888-015-0706-4
9. Altweck L, Marshall TC, Ferenczi N, Lefringhausen K. Mental health literacy: a cross-cultural approach to knowledge and beliefs about depression, schizophrenia and generalized anxiety disorder. Front Psychol. 2015;6(September). doi:10.3389/fpsyg.2015.01272
10. Goyal M, Singh S, Sibinga EMS, et al. Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. JAMA Intern Med. 2014;174(3):357-368. doi:10.1001/jamainternmed.2013.13018.Meditation

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

11. Fritz C, Ellis AM, Demsky C a., Lin BC, Guros F. Embracing work breaks: Recovery from work stress. Organ Dyn. 2013;42(January):274-280. doi:10.1016/j.orgdyn.2013.07.005
12. Centers for Disease Control and Prevention. 1 in 3 adults don't get enough sleep. https://www.cdc.gov/media/releases/2016/p0215-enough-sleep.html. Accessed January 10, 2018.
13. Milner CE, Cote KA. Benefits of napping in healthy adults: Impact of nap length, time of day, age, and experience with napping. J Sleep Res. 2009;18(2):272-281. doi:10.1111/j.1365-2869.2008.00718.x
14. Knifton L, Watson V, Gründemann R, Dijkman A, den Besten H, ten Have K. A Guide for Employers. To Promote Mental Health in the Workplace. Hoofddorp, Netherlands; 2011. www.enwhp.org.
15. National Alliance on Mental Illness-NYC, Northeast Business Group on Health, Partnership for Workplace Mental Health/American Psychiatric Association Foundation, PricewaterhouseCoopers, The Kennedy Forum. Working Well: Leading a Mentally Healthy Business. New York City; 2016.
16. Redeker NS, Caruso CC, Hashmi SD, Mullington JM, Grandner M, Morgenthaler TI. Workplace interventions to promote sleep health and an alert, healthy workforce. J Clin Sleep Med. 2019;15(4):649-657. doi:10.5664/jcsm.7734
17. Centers for Disease Control and Prevention. Sleep: An Important Health and Safety Concern at Work. 2018:1-4.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

M02 NATURE AND PLACE | P

Intent : Support occupant well-being by incorporating the natural environment throughout the project and integrating design strategies that celebrate the project's unique identity.

Summary : This WELL feature requires the integration of nature throughout the project, as well as design strategies that celebrate the project's unique identity and inspires human delight.

Issue : Humans are increasingly living in environments where they have insufficient exposure to nature. [1,2] Natural elements, such as plants and daylight, have been linked with health-promoting benefits, including decreased levels of depression and anxiety, increased attentional capacity, better recovery from job stress and illness, increased pain tolerance and increased psychological well-being.[3–5] The incorporation of plants in the work environment is linked with improved employee morale, job satisfaction, and objective and subjective measures of productivity and with decreased absenteeism.[4,6–8] Finally, the presence of water, natural light and nature views can impact mood, memory and performance in the workplace.[9–11] A dose-response relationship has been found with exposure to indoor nature, with studies showing that as workday nature contact increased, perceived job stress, subjective health complaints and sickness absence decreased.[5,12,13]

Solutions : Incorporating natural elements into buildings can support occupant relief from stress and mental fatigue, as well as help establish a sense of place.[14] The benefits of nature access can be achieved through numerous pathways such as direct (e.g., plants in the office), indirect (e.g., window views) or representational (e.g., photographs).[4] Additionally, incorporating other key aesthetic elements, such as local culture, materials and art can help celebrate the project's unique identity and further enrich the space for occupants and visitors.

PART 1 PROVIDE CONNECTION TO NATURE

For All Spaces except Dwelling Units:

The project integrates the following throughout the space, including common circulation routes, shared seating areas and rooms (e.g., conference rooms, common spaces) and workstations (as applicable):

a. Natural materials, patterns, shapes, images or sounds.[9,15]

b. At least one of the following:

   1. Plants (e.g., potted plants, plant walls).[9,15]
   2. Water (e.g., fountain, pond, fish tank).[9,15]
   3. Nature views.[9,15]

PART 2 PROVIDE CONNECTION TO PLACE

For All Spaces except Dwelling Units:

The project integrates design elements that address the following:

a. Celebration of culture (e.g., culture of occupants, workplace, surrounding community).[16]

b. Celebration of place (e.g., local architecture, materials, flora, artists).[16]

c. Integration of art.[16]

d. Human delight.[16]

REFERENCES

1. Zipperer WC, Pickett ST. Urban Ecology: Patterns of Population Growth and Ecological Effects. eLS. 2012;(2008):1-8. doi:10.1002/9780470015902.a0003246.pub2
2. Hartig T, Mitchell R, de Vries S, Frumkin H. Nature and Health. Annu Rev Public Health. 2014;35(1):207-228. doi:10.1146/annurev-publhealth-032013-182443
3. Wolf K, Krueger S, Flora K. Work and Learning - A Literature Review. Green Cities Good Heal. 2014. www.greenhealth.washington.edu. Accessed January 12, 2018.
4. Larsen L, Adams J, Deal B, Kweon B-S, Tyler E. Plants in the workplace the effects of plant density on productivity, attitudes, and perceptions. Environ Behav. 1998;30(3):261-281.
5. Largo-Wight E, Chen WW, Dodd V, Weiler R. Healthy Workplaces: The Effects of Nature Contact at Work on Employee Stress and Health. Public Health Rep. 2011;126:124-131. doi:10.2307/41639273
6. Kant I, Beurskens a JHM, Amelsvoort LGPM Van, Swaen GMH. An epidemiological approach to study fatigue in the working population: the Maastricht Cohort Study. 2003:32-39.
7. Nieuwenhuis M, Knight C, Postmes T, Haslam S. The relative benefits of green versus lean office space: Three field experiments. J Exp Psychol. 2014;20(3):199-214.
8. Brooks AM, Ottley KM, Arbuthnott KD, Sevigny P. Nature-related mood effects: Season and type of nature contact. J Environ Psychol. 2017;54:91-102. doi:https://doi.org/10.1016/j.jenvp.2017.10.004
9. Kellert SR, Calabrese EF. The Practice of Biophilic Design.; 2015. www.biophilic-design.com.
10. Boubekri M, Cheung IN, Reid KJ, Wang C-H, Zee PC. Impact of Windows and Daylight Exposure on Overall Health and Sleep Quality of Office Workers: A Case-Control Pilot Study. J Clin Sleep Med. 2014;10(6):603-611. doi:10.5664/jcsm.3780
11. Amundadottir ML, Rockcastle S, Sarey Khanie M, Andersen M. A human-centric approach to assess daylight in

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

buildings for non-visual health potential, visual interest and gaze behavior. Build Environ. 2017;113:5-21. doi:10.1016/j.buildenv.2016.09.033

12. Bjornstad S, Patil GG, Raanaas RK. Nature contact and organizational support during office working hours: Benefits relating to stress reduction, subjective health complaints, and sick leave. Work. 2016. doi:10.3233/WOR-152211
13. Fjeld T, Veiersted B, Sandvik L, Riise G, Levy F. The Effect of Indoor Foliage Plants on Health and Discomfort Symptoms among Office Workers. Indoor Built Environ. 1998;7(4):204-209. https://www.karger.com/DOI/10.1159/000024583.
14. An M, Colarelli SM, O'Brien K, Boyajian ME. Why we need more nature at work: Effects of natural elements and sunlight on employee mental health and work attitudes. PLoS One. 2016;11(5):1-17. doi:10.1371/journal.pone.0155614
15. Browning W, Ryan C, Clancy J. 14 Patterns of Biophilic Design. Terrapin Bright Green,LLC. 2014:1-60.
16. International Living Future Institute. Living Building Challenge 4.0, Core Imperative 19 - Beauty + Biophilia.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

M03 MENTAL HEALTH SERVICES | O (MAX : 4 PT)

Intent : To increase awareness of mental health conditions, as well as offer supportive workplace services and accommodations for those living with such conditions.

Summary : This WELL feature requires projects to support occupant mental health through the provision of programs and resources.

Issue : Obtaining appropriate treatment for mental health conditions remains a global barrier. It is estimated that 76-85% of people in low- and middle-income countries and 30-50% in high-income countries receive no treatment, and those who do receive help often face issues with poor quality care.[12] Compared to other illnesses, mental health conditions have longer delays in treatment onset.[3,4] Many factors contribute to this gap, including a lack of healthcare coverage between benefits for mental health, substance abuse and addiction, and benefits for other medical needs, as well as insufficient mental health promotion to increase awareness and minimize the stigma associated with mental health conditions.[5,6] This lack of treatment has major public health and economic consequences: individuals with depression miss an average of 4.8 workdays and experience 11.5 days of reduced productivity in a three-month period, and people living with mental health conditions are overall less likely to receive high quality medical care and preventive health services (e.g., immunizations, cancer screening, tobacco cessation support).[7,8] Furthermore, many individuals who go through emergency situations (e.g., natural disaster) experience psychological distress, resulting in depression, anxiety, feelings of hopelessness, fatigue, irritability or anger.[9,10] These impacts can be exacerbated by added stressors during emergencies such as social isolation, economic hardship or grief, reinforcing the need for adequate access to mental health services.[9,10]

Solutions : Increasing access to screening and mental health services can help encourage care utilization, support early diagnosis and overall mitigate poor mental health outcomes. [5] Enhanced social support and adjustments to the work environment can also help enable a successful return for employees coming back from leave due to a mental health condition.[11,12] Additionally, providing access to mental health services during and after emergency situations, such as psychological first aid, crisis counseling and bereavement counseling, is critical to supporting employee short-term recovery and long-term productivity, functioning and well-being.[9,10,13,14]

PART 1 OFFER MENTAL HEALTH SCREENING (MAX : 1 PT)

For All Spaces:

The project or organization makes a clinical assessment screening tool (e.g., self-assessment, screening tool administered by a professional) for common mental health conditions available to all employees and students either in-person or virtually, at no additional cost. The tool meets the following requirements:

a. Addresses, at minimum, stress, depression, anxiety and substance use.

b. Provides confidentiality by leveraging a licensed mental health professional, third party organization, online screening or health insurance offering.

c. Includes directed feedback and/or guidance on interpretation of results and provides next steps for those who screen positive or at-risk.[6,15]

PART 2 OFFER MENTAL HEALTH SERVICES (MAX : 1 PT)

For All Spaces:

The project or organization makes a mental health benefits policy available to all eligible employees that meets following requirements:

a.

Mental health support is available at no additional cost or subsidized and covers the following at a minimum:

1. Clinical screening and referral to licensed mental health professionals and support resources.[6]
2. Inpatient treatment (e.g., residential programs, hospitalization).[6]
3. Outpatient treatment, including options for telemental health services (e.g., in-person therapy, online therapy).[6,16]
4. Prescription medication.[6]

b. Mental health parity in health service coverage.[6]

c. Information on benefits coverage and how to access mental health services and community resources is easily and confidentially available (e.g., via a health portal or employee website).[6]

d. Confidential benefits consultation with people who are clearly identified and qualified (e.g., benefits counselor, human resources representative) is made available.

PART 3 OFFER EMPLOYEE MENTAL HEALTH SUPPORT (MAX : 1 PT)

For All Spaces:

The project or organization has a mental health policy and the benefits within are made available to all employees without a need to disclose the underlying health reason. The mental health policy meets the following requirements:

a. Sick leave may be used for mental health needs (e.g., appointments).[12,17,18]

b. Short- or long-term leave may be used for mental health needs, with the option of a phased integration back to work after returning from leave.[18,19]

c. Increased interpersonal support (e.g., manager support with prioritizing and managing workloads, increased frequency of one-on-one check-ins).[12]

d. Adjustment of work schedule to support mental health needs (e.g., appointments, start/end times).[12,17,18]

e. Adjustment of the workplace to support mental health (e.g., moving a workstation to a busier or a quieter area, providing a quiet space for breaks, providing earplugs or headphones, increasing personal space, providing the

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

ability to work from home).[12,17,18]

PART 4 B SUPPORT MENTAL HEALTH RECOVERY (MAX : 1 PT)

For All Spaces:

Projects offer mental health services and resources to support recovery from a traumatic event to all employees at no additional cost or subsidized, on-site, in-person within 0.25 mi of the project boundary or virtually, including at least three of the following:

a. Crisis counseling or trauma-focused psychotherapy with qualified mental health professionals.

b. Psychological first aid (PFA) training offered to all employees and/or required for manager-level employees.[20]

c. Bereavement counseling and materials on coping with grief, including resources for returning to work after a loss.

d. Information on benefits coverage and how to access additional mental health services, made conveniently and confidentially accessible to employees.

Note : This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. World Health Organization. Mental disorders. Fact sheets. Published 2018. Accessed July 16, 2018. http://www.who.int/news-room/fact-sheets/detail/mental-disorders
2. Hanisch SE, Twomey CD, Szeto ACH, Birner UW, Nowak D, Sabariego C. The effectiveness of interventions targeting the stigma of mental illness at the workplace: a systematic review. BMC Psychiatry. 2016;16(1):1. doi:10.1186/s12888-015-0706-4
3. Melbourne School of Population and Global Health. Workplace Prevention of Mental Health Problems: Guidelines for Organisations.; 2013.
4. Wang PS, Berglund P, Olfson M, Pincus HA, Wells KB, Kessler RC. Failure and delay in initial treatment contact after first onset of mental disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry. 2005;62(6):603-613. doi:10.1001/archpsyc.62.6.603
5. World Health Organization. Mental Health Action Plan 2013-2020.; 2013. doi:ISBN 978 92 4 150602 1
6. National Alliance on Mental Illness-NYC, Northeast Business Group on Health, Partnership for Workplace Mental Health/American Psychiatric Association Foundation, PricewaterhouseCoopers, The Kennedy Forum. Working Well: Leading a Mentally Healthy Business.; 2016.
7. Reisinger E, McGee R, Druss B. Mortality in Mental Disorders and Global Disease Burden Implications: A Systematic Review and Meta-analysis. JAMA Psychiatry. 2015;72(4):334-341. doi:10.1001/jamapsychiatry.2014.2502.Mortality
8. McGorry PD, Purcell R, Goldstone S, Amminger GP. Age of onset and timing of treatment for mental and substance use disorders: implications for preventive intervention strategies and models of care. Curr Opin Psychiatry. 2011;24(4):301-306. doi:10.1097/YCO.0b013e3283477a09
9. World Health Organization. Mental health in emergencies. WHO Fact Sheets. Published 2019. Accessed June 3, 2020. https://www.who.int/news-room/fact-sheets/detail/mental-health-in-emergencies
10. United Nations. COVID-19 and the Need for Action on Mental Health.; 2020. Accessed May 28, 2020. https://www.un.org/sites/un2.un.org/files/un_policy_brief-covid_and_mental_health_final.pdf
11. Veitch JA. Workplace Design Contributions to Mental Health and Well-Being. Healthc Pap. 2011;11(Special Issue):38-46. doi:10.12927/hcpap.2011.22409
12. Mind. Guide for Employees: Wellness Action Plans (WAPs): How to Support Your Mental Health at Work.
13. Benedek DM, Fullerton C, Ursano RJ. First Responders: Mental Health Consequences of Natural and Human-Made Disasters for Public Health and Public Safety Workers. Annu Rev Public Health. 2007;28(1):55-68. doi:10.1146/annurev.publhealth.28.021406.144037
14. Society of Occupational Medicine. Returning to the Workplace after the COVID-19 Lockdown.; 2020. Accessed June 3, 2020. https://www.som.org.uk/Returning_to_the_workplace_COVID-19_toolkit_FINAL.pdf
15. Centers for Disease Control and Prevention. The CDC Worksite Health ScoreCard: An Assessment Tool for Employers to Prevent Heart Disease, Stroke, and Related Health Conditions.; 2014. https://www.cdc.gov/dhdsp/pubs/docs/hsc_manual.pdf
16. Langarizadeh M, Tabatabaei MS, Tavakol K, Naghipour M, Rostami A, Moghbeli F. Telemental Health Care, an Effective Alternative to Conventional Mental Care: a Systematic Review. Acta Inform Med. 2017;25(4):240-246. doi:10.5455/aim.2017.25.240-246

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

17. World Health Organization. Mental Health Policies and Programmes in the Workplace.; 2005. http://www.who.int/mental_health/policy/services/13_policies programs in workplace_WEB_07.pdf
18. Rethink Mental Illness. What's Reasonable at Work?; 2012.
19. American Psychiatric Foundation. ICU Program Implementation Guide.; 2011.
20. Lewis V, Varker T, Phelps A, Gavel E, Forbes D. Organizational implementation of psychological first aid (PFA): Training for managers and peers. Psychol Trauma Theory, Res Pract Policy. 2014;6(6):619-623. doi:10.1037/a0032556

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

M04 MENTAL HEALTH EDUCATION | O (MAX : 2 PT)

Intent : Promote mental health awareness and education through the provision of mental health-focused training or education offerings.

Summary : This WELL feature requires projects to provide education and training to employees and managers to help them better understand how to manage their own mental health and support others.

Issue : There is a need for increased knowledge regarding causes and recognition of different types of mental health conditions, beliefs about treatment for mental disorders and reduction in stigma against those with mental health conditions.[1,2] The combination of these factors leads to delays in recognition and help-seeking, hinders public acceptance of evidence-based mental health care and denies those with mental health conditions appropriate support from their communities.[2]

Solutions : Workplace mental health education interventions can help create a more supportive work environment. Enhancing knowledge and awareness can help shift perspectives, as well as improve employee mental health via greater and potentially earlier help-seeking.[3] Education and trainings on stigma have been shown to have a positive impact on participants' own general mental health,[3] as well as their behavior toward those with mental health conditions, such as: enhancing perceived confidence and self-efficacy in identifying and supporting a person with a mental health condition, increased likelihood of advising those in need to seek professional help and greater readiness to provide help in a mental health situation.[3] A systematic review of Mental Health First Aid training demonstrated increased participants' knowledge regarding mental health, decreased negative attitudes, increased supportive behavior and confidence in helping others and has been shown to be highly acceptable in a workplace setting.[4,5]

PART 1 OFFER MENTAL HEALTH EDUCATION (MAX : 1 PT)

For All Spaces:

Trainings (in the form of education seminars, workshops or classes) are offered at least twice per year or on demand to regular occupants and meet the following requirements:

a. Address at least two of the following topics:
    1. Managing personal mental health and well-being, covering topics such as developing mentally healthy habits and self-care practices, fostering relationships and social connections and managing mental health at work.[6]
    2. Common mental health conditions or concerns, covering, at minimum, depression, anxiety, substance use, stress, and burnout, and loneliness and social isolation.
    3. Signs and symptoms of mental health distress, including how to identify emotional distress and appropriately respond (e.g., Mental Health First Aid).[6]
b. Provided in-person or virtually (live or recorded), in group or individual settings, and through vendors, on-site staff, health insurance plans, community groups or other qualified programs (e.g., Mental Health First Aid).[7]

PART 2 OFFER MENTAL HEALTH EDUCATION FOR MANAGERS (MAX : 1 PT)

For All Spaces:

All managers undergo annual mental health training (in the form of education seminars, workshops or classes) that meets the following requirements:

a. Addresses at least three of the following topics:
    1. Identifying and reducing workplace stress–related issues (e.g., conducting performance reviews, effective communication skills, personnel management, conflict resolution).[7]
    2. Recognizing common mental health conditions or concerns, covering, at a minimum, depression, anxiety, substance use, stress and burnout, and loneliness and social isolation.[7]
    3. Supporting employee mental well-being using strategies to prevent burnout, low motivation, fatigue, poor work-life balance and other work-related stress issues.[8]
    4. Recognizing employee mental health concerns or crises, including increasing awareness of workplace and community resources available to employees.[7]
b. Provided in-person or virtually (live or recorded), in group or individual settings, and through vendors, on-site staff, health insurance plans, community groups or other qualified programs (e.g., Mental Health First Aid).[7]

REFERENCES

1. Kitchener BA, Jorm AF. Mental health first aid: An international programme for early intervention. Early Interv Psychiatry. 2008;2(1):55-61. doi:10.1111/j.1751-7893.2007.00056.x
2. Svensson B, Hansson L. Effectiveness of mental health first aid training in Sweden. A randomized controlled trial with a six-month and two-year follow-up. PLoS One. 2014;9(6). doi:10.1371/journal.pone.0100911
3. Hanisch SE, Twomey CD, Szeto ACH, Birner UW, Nowak D, Sabariego C. The effectiveness of interventions targeting the stigma of mental illness at the workplace: a systematic review. BMC Psychiatry. 2016;16(1):1. doi:10.1186/s12888-015-0706-4
4. Kitchener BA, Jorm AF. Mental health first aid training for the public: evaluation of effects on knowledge, attitudes and helping behavior. BMC Psychiatry. 2002;2:10. doi:10.1186/1471-244X-2-10
5. Kitchener BA, Jorm AF. Mental health first aid training in a workplace setting: A randomized controlled trial [ISRCTN13249129]. BMC Psychiatry. 2004;4:1-8. doi:10.1186/1471-244X-4-23

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

6. National Alliance on Mental Illness-NYC, Northeast Business Group on Health, Partnership for Workplace Mental Health/American Psychiatric Association Foundation, PricewaterhouseCoopers, The Kennedy Forum. Working Well: Leading a Mentally Healthy Business. New York City; 2016.
7. Centers for Disease Control and Prevention. The CDC Worksite Health ScoreCard: An Assessment Tool for Employers to Prevent Heart Disease, Stroke, and Related Health Conditions. Atlanta; 2014. https://www.cdc.gov/dhdsp/pubs/docs/hsc_manual.pdf.
8. Higgins C, Lyons S, Duxbury L. Reducing Work–Life Conflict: What Works? What Doesn't?

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

M05 STRESS MANAGEMENT | O (MAX : 2 PT)

Intent : Identify areas of stress within the workplace and create a plan for stress management.

Summary : This WELL feature requires projects to assess stress within the organization and create a plan for relieving or modifying sources of stress.

Issue : Stress is directly linked to seven of the ten leading causes of death in the world, as well as numerous negative health consequences, including obesity, high cholesterol, muscle tension and backache, migraines and chronic headaches and poor recovery from illness.[1–4] Stress is also a predictor of adverse mental health outcomes, such as depression, anxiety, substance use, suicide, emotional exhaustion and burnout.[3–5] When stressed, individuals are less likely to engage in other key health behaviors, including smoking cessation, healthful eating and physical activity.[3] Employee stress is incredibly common, with recent studies reporting 94% of workers feel stress on the job and 25% report work as their number one stressor.[6,3] Stressed employees are more likely to quit, be involved in an accident, experience reduced performance and incur an average of nearly 46% higher health care expenditures compared to less-stressed peers.[7] Employees who experience stress are more likely to miss work, resulting in an estimated one million worker absences per day due to stress. [3]

Solutions : Numerous factors increase the likelihood of workplace stress, such as low support from supervisors and colleagues, little control over work processes, unmanageable and high demands, concern over a lack of job security and low opportunity for advancement or professional development.[3]Stress and its associated risks can be reduced through interventions that adjust job stressors, such as changes in operations, increases in co-worker and supervisor support and training employees in developing resilience to withstand job stressors.[4,5]

PART 1 DEVELOP STRESS MANAGEMENT PLAN (MAX : 2 PT)

For All Spaces:

The project or organization develops a stress management plan by completing the following:

a. Assess at least three of the organization- or project-wide metrics below:
    1. Frequency of employees working more than 48 hours per seven-day period.[8]
    2. Frequency of absenteeism amongst employees (i.e., use of paid or unpaid time off due to disability or illness).
    3. Frequency of employees not using allocated paid time off.
    4. Frequency of performance issues amongst employees.
    5. Employee retention and turnover rates.
    6. Responses to employee satisfaction surveys that indicate high levels of stress or burnout
b. Identify opportunities for improvement, covering the topics below:
    1. Organizational change to address employee stress (e.g., adjustments to work environment, shifts in work processes, workload, management or staffing).[9]
    2. Employee participation in organizational decisions regarding work-related issues that may affect stress (e.g., work environment, processes, scheduling).[9]
c. Create and implement a stress management plan that identifies the following:
    1. The person leading implementation of the plan.[10]
    2. The changes that are to be completed as part of the plan.[10]
    3. Who will be impacted by those changes.[10]
    4. When and how the changes will be implemented.[10]
    5. Confirmation of support from executive leadership.[4]

REFERENCES

1. Quick J, Henderson D. Occupational Stress: Preventing Suffering, Enhancing Wellbeing. Int J Environ Res Public Health. 2016;13(5):459. doi:10.3390/ijerph13050459
2. Higgins C, Lyons S, Duxbury L. Reducing Work–Life Conflict: What Works? What Doesn't?
3. Sharma M, Rush SE. Mindfulness-Based Stress Reduction as a Stress Management Intervention for Healthy Individuals. J Evid Based Complementary Altern Med. 2014;19(4):271-286. doi:10.1177/2156587214543143
4. Institute for Health and Productivity Studies Johns Hopkins Bloomberg School of Public Health. From Evidence to Practice: Workplace Wellness that Works. 2015. https://www.transamericacenterforhealthstudies.org/docs/default-source/wellness-page/from-evidence-to-practice---workplace-wellness-that-works.pdf?sfvrsn=2.
5. LaMontagne AD, Martin A, Page KM, et al. Workplace mental health: developing an integrated intervention approach. BMC Psychiatry. 2014;14(1):131. doi:10.1186/1471-244X-14-131
6. The Stress Epidemic: Employees Are Looking for a Way Out.
7. Anderson DR, Whitmer RW, Goetzel RZ, Ozminkowski RJ, Wasserman J, Serxner S. The Relationship Between Modifiable Health Risks and Group-level Health Care Expenditures. Am J Heal Promot. 2000;15(1):45-52. doi:10.1097/00043764-199810000-00003
8. European Parliament, Council of the European Union. Directive 2003/88/EC of the European Parliament and of the Council of 4 November 2003 concerning certain aspects of the organisation of working time. 2004;8(1):3.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

doi:10.4201/lsjm.car.002

9. Centers for Disease Control and Prevention. The CDC Worksite Health ScoreCard: An Assessment Tool for Employers to Prevent Heart Disease, Stroke, and Related Health Conditions. Atlanta; 2014. https://www.cdc.gov/dhdsp/pubs/docs/hsc_manual.pdf.
10. Knifton L, Watson V, Gründemann R, Dijkman A, den Besten H, ten Have K. A Guide for Employers. To Promote Mental Health in the Workplace. Hoofddorp, Netherlands; 2011. www.enwhp.org.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

M06 RESTORATIVE OPPORTUNITIES | O (MAX : 2 PT)

Intent : Support employee well-being by providing opportunities for recovery and restoration within and outside the workplace.

Summary :
This WELL feature requires projects to support recovery and restoration from work and to encourage a healthy work-life balance by providing opportunities for sleep, breaks throughout the workday and sufficient paid time off.

Issue : Long working hours and insufficient opportunities for recovery are associated with numerous adverse outcomes, including cardiovascular and immunologic reactions, reduced sleep quality and duration and increased risk for stress, burnout, excessive alcohol use and poor diet.[1,2] Insufficient sleep, in particular, is associated with numerous negative outcomes, such as increased pain and anxiety, impaired performance and productivity and increased errors and risk of accidents.[3–5] Long hours are also connected to reductions in employee creativity and morale.[2,6] Research shows that working over weekends inhibits recovery from work-related stress and that ongoing periods without vacation have adverse health effects, including increased cardiovascular risk.[5]

Solutions : Employees need sufficient opportunities to psychologically detach and recover during non-work hours, such as weekends, vacations and evenings. [5] Findings indicate that mentally distancing oneself from work and engaging in restorative activities on a day-to-day basis is linked to employee well-being, including higher life satisfaction and mood, maintained workplace performance, lower burnout and fewer health complaints.[5] Targeted interventions, such as limits on working hours and schedule, can help support individuals in achieving sufficient and high-quality sleep.[7,8] Research indicates that regular vacations may have a protective effect against chronic work stress by providing a sustained period of relief from daily stressors, demands and routines.[9,10] Short afternoon naps also provide an opportunity for restoration during the workday, leading to benefits in mood, alertness and cognitive performance, such as productivity and learning.[11,12]

PART 1 SUPPORT HEALTHY WORKING HOURS (MAX : 1 PT)

For All Spaces:

The project or organization has a policy on schedules and time off that meets the following requirements:

a. For all employees:
    1. A minimum of 11 consecutive hours off from work is available per 24-hour period.[13,14]
    2. A minimum of 24 consecutive hours off from work is available per 7-day period.[14]
    3. Employees who engage in shift work are provided a minimum 48-hour advance notice of shift changes.
b. For all eligible employees:
    1. A minimum of 20 days of paid time off per calendar year (not including paid sick days or public holidays).[14]
    2. Work and work-related communications are not required during paid time off.[5]
    3. Sick, vacation, floating holiday, personal and all other employer-provided days off from work are clearly defined.
    4. Accrual policy is defined, including whether rollover days are allowed and date by which rollover days must be used.
c. For students in secondary schools (if applicable), the school day starts no earlier than 8:30 a.m.[17]

PART 2 PROVIDE NAP POLICY AND SPACE (MAX : 1 PT)

For All Spaces:

1: Nap policy

The following requirement is met for all eligible employees:

a. Employees are allowed to engage in at least one nap or rest break of at least 30 minutes during the workday (not to be combined with designated time for meal breaks).[13,18]

2: Nap space

The following requirements are met for all eligible employees:

a. Access to at least one acoustically and visually separated environment located in a designated quiet zone.
b. At least one fully reclining furniture option (e.g., bed, daybed, couch, chair, cushioned roll-out mat, nap pod) for every 100 eligible employees.[13,18]

Note :

Projects should refer to feature S01 Sound Mapping, Part 1: Label Acoustical Zones for all designated quiet zones.

Projects can utilize one room as a combined nap space (M06) and restorative space (M07). Projects will only receive points for both features, if all requirements for M06 Part 2 and M07 Part 1 have been met.

REFERENCES

1. Snow DL, Swan SC, Wilton LEO. A Workplace Coping-skills Interventionto Prevent Alcohol Abuse. In: Bennet JB, Lehman WEK, eds. Preventing Workplace Substance Abuse: Beyond Drug Testing to Wellness. American

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Psychological Association; 2003.
2. Rethink Mental Illness. What's Reasonable at Work? England; 2012.
3. Centers for Disease Control and Prevention. Sleep and Chronic Disease. https://www.cdc.gov/sleep/about_sleep/chronic_disease.html. Accessed January 10, 2018.
4. Zerella S, von Treuer K, Albrecht SL. The influence of office layout features on employee perception of organizational culture. J Environ Psychol. 2017;54:1-10. doi:https://doi.org/10.1016/j.jenvp.2017.08.004
5. Fritz C, Ellis AM, Demsky C a., Lin BC, Guros F. Embracing work breaks: Recovery from work stress. Organ Dyn. 2013;42(January):274-280. doi:10.1016/j.orgdyn.2013.07.005
6. Virtanen M, Singh-Manoux A, Ferrie JE, et al. Long working hours and cognitive function: The Whitehall II study. Am J Epidemiol. 2009;169(5):596-605. doi:10.1093/aje/kwn382
7. Centers for Disease Control and Prevention. Sleep Hygiene Tips - Sleep and Sleep Disorders. https://www.cdc.gov/sleep/about_sleep/sleep_hygiene.html. Accessed January 11, 2018.
8. Watson NF, Badr MS, Belenk G, Bliwise DL. Recommended amount of sleep for a healthy adult. Am Acad Sleep Med Sleep Res Soc. 2015;38(6):843-844. doi:10.5665/sleep.4716
9. Soboczenski F. Project: Time Off Research Overview. Georg Tech. 2015;(July):1-3. doi:10.1002/ddr.20008
10. Gump BB, Matthews KA. Are Vacations Good for Your Health? The 9-Year Mortality Experience After the Multiple Risk Factor Intervention Trial. Psychosom Med. 2000;612:608-612.
11. Centers for Disease Control and Prevention. 1 in 3 adults don't get enough sleep. https://www.cdc.gov/media/releases/2016/p0215-enough-sleep.html. Accessed January 10, 2018.
12. Milner CE, Cote KA. Benefits of napping in healthy adults: Impact of nap length, time of day, age, and experience with napping. J Sleep Res. 2009;18(2):272-281. doi:10.1111/j.1365-2869.2008.00718.x
13. Redeker NS, Caruso CC, Hashmi SD, Mullington JM, Grandner M, Morgenthaler TI. Workplace interventions to promote sleep health and an alert, healthy workforce. J Clin Sleep Med. 2019;15(4):649-657. doi:10.5664/jcsm.7734
14. European Parliament, Council of the European Union. Directive 2003/88/EC of the European Parliament and of the Council of 4 November 2003 concerning certain aspects of the organisation of working time. 2004;8(1):3. doi:10.4201/lsjm.car.002
15. National Institute for Occuptational Safety and Health. Plain Language About Shiftwork.; 1997.
16. Higgins C, Lyons S, Duxbury L. Reducing Work–Life Conflict: What Works? What Doesn't?
17. American Academy of Pediatrics. School Start Times for Adolescents. Pediatrics. 2014;134(3):642-649. doi:10.1542/peds.2014-1697
18. Centers for Disease Control and Prevention. Sleep: An Important Health and Safety Concern at Work. 2018:1-4.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

M07 RESTORATIVE SPACES | O (MAX : 1 PT)

Intent : Support access to spaces that promote restoration and relief from mental fatigue or stress.

Summary : This WELL feature requires projects to provide spaces that promote a restorative environment and encourage relief from mental fatigue and stress.

Issue : Work-induced fatigue is common among office workers, with research indicating that over 20% of the workforce experiences prolonged fatigue. [1,2] During the workday, individuals experience fatigue caused by a depletion of physical and mental resources, resulting in an accumulated need to recover from mental fatigue and stress.[1] The experience of prolonged fatigue combined with a high need for mental recovery is strongly associated with psychological distress, including decreased mental acuity, deficits in motivation and irritability caused by prolonged exposure to stress.[1,2]

Solutions : By providing restorative spaces for individuals to step away from the stress of the office environment, recharge and refocus, employers can help alleviate the negative effects associated with workplace fatigue or mental depletion.[3] Through incorporation of nature, among other restorative elements, these spaces can help relieve stress and mental fatigue, support focus and encourage overall mental well-being.[4] Exposure to plants and other natural elements has been linked with decreased levels of diastolic blood pressure, depression and anxiety, increased attentional capacity, better recovery from job stress and increased psychological well-being.[5,6] Nature interaction has also been shown to support recovery from illness and increase pain tolerance.[5,6] Outdoor spaces can also be used to promote calm and encourage restorative activities. Both indoor and outdoor spaces can also be used for individuals with a wide variety of beliefs, religions and traditions, including prayer and meditation.

PART 1 PROVIDE RESTORATIVE SPACE (MAX : 1 PT)

For All Spaces:

1: Restorative space

The project provides at least one indoor or outdoor space for all regular occupants. The space may be made up of a single space or multiple spaces that meet the following requirements:

a. The main purpose is for relaxation and restoration. Space may serve multiple functions but is not to be used for work.

b. Minimum size of 75 ft^2 plus 1 ft^2 per regular occupant or 2,000 ft^2 whichever is smaller.

c. Provides a calming and comfortable environment by incorporating at least five of the following:

   1. Adjustable lighting (e.g., dimmable light levels for indoor spaces).[7]
   2. Sound interventions (e.g., water feature, natural sounds, sound masking).[8,9]
   3. Thermal control (e.g., fans, shading).[10]
   4. Seating arrangements that accommodate a range of user preferences and activities (e.g., movable lightweight chairs, cushions, mats).[7]
   5. Nature or natural elements.[11-13]
   6. Subdued colors, textures and forms.[14-15]
   7. Visual privacy.[16]

d. Includes signage, education materials or other resources explaining its purpose and intended use.

Note : If restorative space is provided only outdoors, it must be functional year-round.

2: Workday breaks

The project encourages the use of restorative space(s) through the following:

a. Paid breaks away from the workstation for all employees.[17]

REFERENCES

1. de Bloom J, Kompier M, Geurts S, de Weerth C, Taris T, Sonnentag S. Do we recover from vacation? Meta-analysis of vacation effects on health and well-being. J Occup Health. 2009;51(1):13-25. doi:10.1539/joh.K8004
2. Smolders KCHJ, de Kort YAW, Tenner AD, Kaiser FG. Need for recovery in offices: Behavior-based assessment. J Environ Psychol. 2012;32(2):126-134. doi:https://doi.org/10.1016/j.jenvp.2011.12.003
3. Nejati A, Rodiek S, Shepley M. The implications of high-quality staff break areas for nurses' health, performance, job satisfaction and retention. J Nurs Manag. 2016;24(4):512-523. doi:10.1111/jonm.12351
4. Kant I, Beurskens a JHM, Amelsvoort LGPM Van, Swaen GMH. An epidemiological approach to study fatigue in the working population: the Maastricht Cohort Study. Published online 2003:32-39.
5. Larsen L, Adams J, Deal B, Kweon BS, Tyler E. Plants in the workplace the effects of plant density on productivity, attitudes, and perceptions. Environ Behav. 1998;30(3):261-281.
6. Wolf K, Krueger S, Flora K. Work and Learning - A Literature Review. Green Cities: Good Health. Published online 2014.
7. Marquardt C, Veitch J, Charles K. Environmental Satisfaction with Open-plan Office Furniture Design and Layout. Research Report RR-106. Published online 2002.
8. Shu S, Ma H. Restorative Effects of Classroom Soundscapes on Children's Cognitive Performance. . Int J Environ Res Public Health. 2019;16(2):293.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

9. DeLoach AG, Carter JP, Braasch J. Tuning the cognitive environment: Sound masking with "natural" sounds in open-plan offices. J Acoust Soc Am. 2015;137(4):2291. doi:10.1121/1.4920363
10. Zhang H, Arens E, Pasut W. Air Temperature Thresholds for Indoor Comfort and Perceived Air Quality. Building Research and Information. 2011;39(2):134-144.
11. Martinez Castro I. Space to Connect. Facilities Management Journal. Published online 2019.
12. Berman M, Jonides J, Kaplan S. The Cognitive Benefits of Interacting with Nature. Psychol Sci. 2008;19(12):1207-1212.
13. Kelz C, Grote V, Moser M. Interior Wood Use in Classrooms Reduce Pupils' Stress Levels. In: Proceedings of the 9th Biennial Conference on Environmental Psychology. ; 2011.
14. Li X, Zhange Z, Gu MM, et al. Effects of Plantscape Colors on Psycho-physiological Responses of University Students. J Food Agric Environ. 2012;10(1):702-708.
15. Vartanian O, Navarrete G, Chatterjee A, et al. Preference for Curvilinear Contour in Interior Architectural Spaces: Evidence from Experts and Nonexperts. Psychology of Aesthetics Creativity and the Arts . 2017;13(1):110-116.
16. Marguilis S. Privacy as a Social Issue and Behavioral concept. Journal of Social Issues. 2003;59(2):243-261.
17. Fritz C, Ellis AM, Demsky C a., Lin BC, Guros F. Embracing work breaks: Recovery from work stress. Organ Dyn. 2013;42(January):274-280. doi:10.1016/j.orgdyn.2013.07.005

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

M08 RESTORATIVE PROGRAMMING | O (MAX : 1 PT)

Intent : Support access to programs that promote restoration and relief from mental fatigue or stress.

Summary : This WELL feature requires projects to develop ongoing programming for occupants that is focused on relaxation, restoration or mindfulness, such as meditation or mindful movement.

Issue : Workplace stress is incredibly common. In the European Union, for example, an estimated one in three workers experience work-related stress.[1] Exposure to stressful work conditions is associated with poor mental and physical health.[2] Highly stressed employees are at risk for numerous negative outcomes, including decreased productivity, greater absenteeism, increased occupational injury and higher overall medical expenditures.[3-5]

Solutions : Introducing mindfulness into the workplace has been shown to lower employee stress, as well as improve focus, clarity of thinking, decision-making and emotional intelligence.[6,7] Meditation interventions targeting workers have been found to be effective at reducing work-associated stress, depression, anxiety and burnout, as well as improving mood and sleep quality.[8-11] A recent systematic review concluded that mindfulness meditation can help reduce negative dimensions of psychological stress, including improving anxiety, depression, pain, stress and overall mental health.[12] Mindfulness-based stress reduction, a widely disseminated and frequently used practice, has been shown to reduce symptoms of stress, depression and anxiety, and enhance self-esteem, body image, mood and coping with other health problems, such as chronic pain, fatigue, stress and insomnia.[13-15] Mindfulness-based practices, whether formal or informal, can help improve employee focus and productivity, support stress management and reduce employer costs through improvements to overall health and well-being.[7-11]

PART 1 PROVIDE RESTORATIVE PROGRAMMING (MAX : 1 PT)

For All Spaces:

At least two of the following are offered to all eligible employees at no cost or subsidized by at least 50%:

a. Mindfulness training course (e.g., eight-week mindfulness-based stress reduction course (MBSR)) offered live, either in-person or virtually, by a qualified mindfulness instructor at least twice a year, that meets the following:
    1. Defines mindfulness and its component parts.
    2. Covers relevant research on mindfulness.
    3. Teaches both formal practices (e.g., mindfulness meditation, yoga postures) and informal practices (e.g., mindful eating, mindful listening) that can be applied during the workday.
b. Mindfulness programming (e.g., guided meditation, yoga) offered live, either in-person or virtually, at least once a week in a designated quiet zone.
c. Digital mindfulness offerings (e.g., guided meditation application). Employees have unlimited access to at least one digital offering and access to at least one designated quiet zone.

Note : Refer to feature S01 Sound Mapping, Part 1: Label Acoustical Zones for all designated quiet zones.

REFERENCES

1. Leka S, Jain A. Health Impact of Psychosocial Hazards at Work: An Overview.; 2010.
2. Honkonen T, Ahola K, Pertovaara M, et al. The Association Between Burnout and Physical Illness in the General Population—Results from the Finnish Health 2000 Study. J Psychosom Res. 2006;61(1):59-66.
3. Burchadt T. Department for Work and Pensions Research Branch In-House Reports 109: Employment Retention and the Onset of Sickness or Disability: Evidence from the Labour Force Survey Longitudinal Datasets.; 2003.
4. Dembe A, Erickson J, Delbos R, Banks S. The Impact of Overtime and Long Work Hours on Occupational Injuries and Illnesses: New evidence from the United States. Occupational Environmental Medicine 2005;62(9):588-597. 2005;62(9):588-597.
5. Hassard J, Teoh KRH, Visockaite G, Dewe P, Cox T. The Cost of Work-related Stress to Society: A systematic review. J Occup Health Psychol. 2018;23(1):1-17.
6. Chen KW, Berger CC, Manheimer E, et al. Meditative Therapies for Reducing Anxiety: A systematic review and meta-analysis of randomized controlled trials. Depress Anxiety. 2012;29(7):545-562.
7. Chan D, Woollacott M. Effects of level of meditation experience on attentional focus: is the efficiency of executive or orientation networks improved? J Altern Complement Med. 2007;13(6):651-657. doi:10.1089/ACM.2007.7022
8. Santamaría-Peláez M, González-Bernal JJ, Verdes-Montenegro-Atalaya JC, et al. Mindfulness-Based Program for Anxiety and Depression Treatment in Healthcare Professionals: A Pilot Randomized Controlled Trial. 2021;10(24):5941.
9. Smith S. Mindfulness-Based Stress Reduction: An Intervention to Enhance the Effectiveness of Nurses' Coping with Work-Related Stress. Int J Nurs Knowl. 2014;25(2):119-130.
10. Rusch H, Rosario M, Leyison L, et al. The Effect of Mindfulness Meditation on Sleep Quality; A systematic review and meta-analysis of randomized controlled trials. Ann N Y Acad Sci. 2019;1445(1):5-6.
11. Thimmapuram J, Pargament R, Sibliss K, Grim R, Risques R, Toorens E. Effect of Heartfulness Meditation on Burnout, emotional Wellness, and Telomere Length in Health Care Professionals. J Community Hosp Intern Med Perspect. 2017;7(1):21-27.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

12. Goyal M, Singh S, Sibinga EMS, et al. Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. JAMA Intern Med. 2014;174(3):357-368. doi:10.1001/jamainternmed.2013.13018.Meditation
13. Schaufenbuel K. Bringing Mindfulness to the Workplace. Published online 2014:1-13.
14. Higgins C, Lyons S, Duxbury L. Reducing Work–Life Conflict: What Works? What Doesn't?
15. Kachan D, Olano H, Tannenbaum SL, et al. Prevalence of Mindfulness Practices in the US Workforce: National Health Interview Survey. Prev Chronic Dis. 2017;14:160034. doi:10.5888/pcd14.160034

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

M09 ENHANCED ACCESS TO NATURE | O (MAX : 2 PT)

Intent : Support access to nature beyond M02: Access to Nature and Beauty, by further incorporating nature through interior design, exterior design and access to nearby nature.

Summary : This WELL feature requires the integration of nature and natural elements into the interior and exterior of the project, as well as the provision of nature views and nearby nature, such as green and blue spaces.

Issue : Exposure to plants and other natural elements has been linked with decreased levels of diastolic blood pressure, depression and anxiety, increased attentional capacity, better recovery from job stress and illness, increased psychological well-being and increased pain tolerance.[1,2] The incorporation of plants in the work environment is linked with improved employee morale, decreased absenteeism and increased worker efficiency and job satisfaction.[1,3] The incorporation of water into built spaces can also relieve stress, promote satisfaction and enhance performance.[4] Access to outdoor green spaces is associated with a range of short- and long-term mental health benefits for individuals across the life span, from children to older adults.[5–7] The many associated benefits include lower levels of anxiety and depression, as well as improved mental recovery from stress and fatigue. [8]

Solutions : A dose-response relationship has been found with exposure to indoor nature, with research finding that as workday nature contact increased, perceived job stress, subjective health complaints and sickness absence decreased.[9–11] Researchers also hypothesize that access to outdoor green spaces impacts mental health and well-being through cognitive restoration, and that physiological and emotional changes take place, when individuals are exposed to natural settings.[12] The benefits of nature access have been found across age groups, and supporting access to outdoor green and natural spaces can support the health and well-being of a wide range of individuals within a built community.[13,14]

PART 1 PROVIDE NATURE ACCESS INDOORS (MAX : 1 PT)

For All Spaces:

The project's floor plan is designed such that at least 75% of workstations, conference room seats, classroom seats and seating within common spaces meets at least one of the following requirements:

a. Have a direct line of sight to indoor plant(s), water feature(s) and/or nature view(s).

b. Are within 33 ft of indoor plant(s), water feature(s) and/or nature view(s).

Note :
Water features that may produce water aerosols (e.g., decorative fountains) cannot be installed in hospitals, healthcare settings or senior living facilities.[15]

PART 2 PROVIDE NATURE ACCESS OUTDOORS (MAX : 1 PT)

For All Spaces:

1: Outdoor nature

One of the following requirements is met:

a. Outdoor nature access facilitated by the conditions below:

   1. One or more outdoor spaces that collectively total at least 5% of the project interior area are available to all regular occupants.
   2. At least 70% of the outdoor space must be covered by plants, water or other natural elements. Use the area of each tree or shrub canopy to calculate their contributions to the total area.

b. Nearby nature access facilitated by the conditions below:

   1. At least one green space or blue space is within a 650 ft walk distance from the project boundary and available to all regular occupants during open hours of the space(s).
   2. Total combined green space must be at least 1.25 acre.[16]

2: Outdoor nature access

The following requirement is met:

a. Occupants are encouraged to access outdoor nature (e.g., presence of signage or maps to outdoor nature, availability of breaks during the workday to go visit outdoor nature).

Note :
Interiors projects may count base building amenities towards feature requirements.

REFERENCES

1. Larsen L, Adams J, Deal B, Kweon B-S, Tyler E. Plants in the workplace the effects of plant density on productivity, attitudes, and perceptions. Environ Behav. 1998;30(3):261-281.
2. Wolf K, Krueger S, Flora K. Work and Learning - A Literature Review. Green Cities Good Heal. 2014. www.greenhealth.washington.edu. Accessed January 12, 2018.
3. Kant I, Beurskens a JHM, Amelsvoort LGPM Van, Swaen GMH. An epidemiological approach to study fatigue in the working population: the Maastricht Cohort Study. 2003:32-39.
4. Kellert SR, Calabrese EF. The Practice of Biophilic Design.; 2015. www.biophilic-design.com.
5. Pearson DG, Craig T. The great outdoors? Exploring the mental health benefits of natural environments. Front Psychol. 2014;5:1-4. doi:10.3389/fpsyg.2014.01178
6. Aggio D, Smith L, Fisher A, Hamer M. Mothers' perceived proximity to green space is associated with TV viewing

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

time in children: the Growing Up in Scotland study. Prev Med (Baltim). 2015;70:46-49.

7. Wu YT, Prina AM, Jones A, Matthews FE, Brayne C. Older people, the natural environment and common mental disorders: Cross-sectional results from the Cognitive Function and Ageing Study. BMJ Open. 2015;5:1-9. doi:10.1136/bmjopen-2015-007936
8. Beyer KMM, Kaltenbach A, Szabo A, Bogar S, Javier Nieto F, Malecki KM. Exposure to Neighborhood Green Space and Mental Health: Evidence from the Survey of the Health of Wisconsin. Int J Environ Res Public Health. 2014;11(3):3453-3472. doi:10.3390/ijerph110303453
9. Bjornstad S, Patil GG, Raanaas RK. Nature contact and organizational support during office working hours: Benefits relating to stress reduction, subjective health complaints, and sick leave. Work. 2016. doi:10.3233/WOR-152211
10. Fjeld T, Veiersted B, Sandvik L, Riise G, Levy F. The Effect of Indoor Foliage Plants on Health and Discomfort Symptoms among Office Workers. Indoor Built Environ. 1998;7(4):204-209. https://www.karger.com/DOI/10.1159/000024583.
11. Largo-Wight E, Chen WW, Dodd V, Weiler R. Healthy Workplaces: The Effects of Nature Contact at Work on Employee Stress and Health. Public Health Rep. 2011;126:124-131. doi:10.2307/41639273
12. Staats H, Jahncke H, Herzog TR, Hartig T. Urban Options for Psychological Restoration: Common Strategies in Everyday Situations. PLoS One. 2016;11(1):1-24. doi:10.1371/journal.pone.0146213
13. Alcock I, White MP, Wheeler BW, Fleming LE, Depledge MH. Longitudinal Effects on Mental Health of Moving to Greener and Less Green Urban Areas. Environ Sci Technol. 2014;48(2):1247-1255. doi:10.1021/es403688w
14. White MP, Alcock I, Grellier J, et al. Spending at least 120 minutes a week in nature is associated with good health and wellbeing. Sci Rep. 2019;9(1):1-11. doi:10.1038/s41598-019-44097-3
15. Health Protection Surveillance Centre. National Guidelines for the Control of Legionellosis in Ireland - 8.4.1 Hospitals and Healthcare Institutions. Deblin, Ireland; 2009.
16. World Health Organization. Urban Green Spaces and Health: a Review of Evidence. WHO Reg Off Eur. 2016:80. http://www.euro.who.int/__data/assets/pdf_file/0005/321971/Urban-green-spaces-and-health-review-evidence.pdf?ua=1.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

M10 TOBACCO CESSATION | O (MAX : 3 PT)

Intent : Reduce the use of tobacco through interventions that support tobacco cessation and prevent the sale and advertisement of tobacco products.

Summary : This WELL feature requires projects that sell retail goods to restrict sale and marketing of tobacco products and supports employee access to tobacco cessation support programs.

Issue : Tobacco is responsible for an estimated six million deaths per year globally among direct users, and serves as the cause of death for up to half of its users. [1,2] In addition to those deaths caused by direct use, an estimated 890,000 annual deaths can be attributed to non-user exposure to second-hand smoke.[1] In the workplace, employees that smoke incur greater absences, take more sick days and have higher health care costs than non-smoking employees.[3] Despite tobacco's impact, national comprehensive health services that fully or partially cover services to support tobacco cessation are only available in 24 countries, benefiting just 15% of the world's population.[1,4] Although 70% of U.S. adult smokers are interested in quitting and 40% of smokers attempt to quit each year, only 8% of smoking employees report that their workplace offers smoking cessation assistance.[5–7]

Solutions : Employers can play a key role in supporting employee tobacco cessation efforts.[7] Among those who attempt to quit, counseling and medication more than double the chance of quitting success.[1] Worksite-based incentives and competitions, when combined with additional interventions to support individual cessation efforts, can be effective in reducing tobacco use among workers.[8] Another influencing factor on tobacco use is an individual's proximity to outlets where it is sold.[9] Restricting the sale of tobacco on-site is a key strategy for preventing or curbing use of tobacco products, as well as providing support to those trying to quit.[9,10]

PART 1 PROVIDE TOBACCO CESSATION RESOURCES (MAX : 2 PT)

For All Spaces:

1: Incentive program and cessation resources

The following requirements are met:

a. The project or organization implements a tobacco cessation program for all eligible employees that meets the following:
   1. Focuses on increasing or improving motivation or action to quit, or maintaining quit effort.[8,11]
   2. Includes incentives or rewards (e.g., direct financial payments, lottery for prizes) provided for participation in quit effort or success in abstaining from tobacco use.[8,11]

b. Tobacco cessation resources are available to all eligible employees at no cost or are subsidized and meet the following:
   1. Resources referring tobacco users to tobaco cessation telephone quit lines or online quitting resources.[11]
   2. Tobacco cessation counseling. Programs may be provided in-person or virtually; in group or individual settings; through vendors, on-site staff, health insurance plans or programs, community groups or other qualified professionals (e.g., tobacco cessation specialist).[11]
   3. Prescription tobacco cessation medications and nicotine replacement products (e.g., inhalers, nasal sprays, bupropion, varenicline).[11]
   4. Over-the-counter nicotine replacement products (e.g., nicotine gum, patches, lozenges).[11]

PART 2 LIMIT TOBACCO AVAILABILITY (MAX : 1 PT)

For Retail Spaces:

The following requirements are met for projects where retail products are sold on a daily basis:

a. Sale of tobacco products (including e-cigarettes) is prohibited.[11]

b. Tobacco products (including e-cigarettes) are not marketed or promoted.[12]

REFERENCES

1. World Health Organization. Tobacco. http://www.who.int/mediacentre/factsheets/fs339/en/. Published 2017. Accessed January 9, 2018.
2. World Health Organization. WHO global report on trends in prevalence of tobacco smoking 2015. WHO Mag. 2015:1-359. doi:978 92 4 156492 2
3. Smith DR. Workplace tobacco control: The nexus of public and occupational health. Public Health. 2009;123(12):817-819. doi:10.1016/j.puhe.2009.10.014
4. World Health Organization. Global status report on noncommunicable diseases 2010. World Heal Organ. 2011:176. doi:ISBN 978 92 4 156422 9
5. Centers for Disease Control and Prevention. Cigarette Smoking Among Adults --- United States, 2000. MMWR Wkly. 2002;51(29):642-645. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5129a3.htm.
6. Centers for Disease Control and Prevention. Cigarette Smoking Among Adults --- United States, 2007. MMWR Wkly. 2008;57(45):1221-1226. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5745a2.htm.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

7. Halpern MT, Taylor H. Employee and Employer Support for Workplace-based Smoking Cessation: Results from an International Survey. J Occup Health. 2010;52(6):375-382. doi:10.1539/joh.L10075
8. The Community Preventive Services Task Force. Reducing Tobacco Use and Secondhand Smoke Exposure: Worksite-based Incentives and Competitions When Combined with Additional Interventions. 2014;38.
9. Reitzel LR, Cromley EK, Li Y, et al. The Effect of Tobacco Outlet Density and Proximity on Smoking Cessation. Am J Public Health. 2011;101(2):315-320. doi:10.2105/AJPH.2010.191676
10. Polinski J, Howell B, Gagnon M, Kymes S, Brennan T, Shrank W. Impact of CVS Pharmacy's Discontinuance of Tobacco Sales on Cigarette Purchasing (2012-2014). Am J Public Health. 2017;107(4):556-562. doi:10.2105/AJPH.2016.303612
11. Centers for Disease Control and Prevention. The CDC Worksite Health ScoreCard: An Assessment Tool for Employers to Prevent Heart Disease, Stroke, and Related Health Conditions. Atlanta; 2014. https://www.cdc.gov/dhdsp/pubs/docs/hsc_manual.pdf.
12. Calo WA, Krasny S. Environmental Determinants of Smoking Behaviors: The Role of Policy and Environmental Interventions in Preventing Smoking Initiation and Supporting Cessation. Curr Cardiovasc Risk Rep. 2013;7(6):446-452. doi:10.1007/s12170-013-0344-7

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

M11 SUBSTANCE USE SERVICES | O (MAX : 2 PT)

Intent : Increase availability and access to substance abuse and addiction support services, resources and care and prevent the development of substance abuse and addiction among occupants.

Summary : This WELL feature requires projects to outline policies regarding drug and alcohol use in the workplace, provide education on substance use and addiction and support access to substance use services.

Issue : Alcohol and drug use contribute significantly to the global burden of premature death and disability. [1] Harmful use of alcohol is a leading global risk factor, accounting for 3.3 million deaths per year (or 5.9% of all deaths) and 5.1% of the global burden of disease in 2014.[2] Within the workplace, alcohol use is a significant risk factor for absenteeism, presenteeism, accidents and employee turnover.[3,4] It is also estimated that approximately half of the overall social costs of alcohol are due to lost productivity.[3] In addition to alcohol, illicit drug use remains a serious global public health concern: in 2013, 246 million people between 15 and 64 years of age used illicit drugs, of which one in ten suffered from a drug use disorder or dependency.[5]

Solutions : Prevention programs that address substance use through education and workplace policy, as well as available and affordable screening and treatment offerings, have been shown to be effective methods of preventing unhealthy substance use habits and supporting those struggling with substance abuse and addiction.[3,4,6] The return on investment in offering substance use treatment and prevention services is known. For example, each $1 invested in screening and brief counseling interventions saves approximately $4 in health care costs.[7] Offering prevention, education and support services provides an opportunity to reduce the costs companies face as a result of undiagnosed and untreated substance abuse. [7]

PART 1 OFFER SUBSTANCE USE EDUCATION (MAX : 1 PT)

For All Spaces:

1: Substance use policy and education

The following requirements are met:

a. A policy is in place regarding the use of alcohol, legal and recreational drugs on-site and is clearly communicated to all regular occupants.[7]

b. Trainings (in the form of education seminars, workshops or classes) are offered at least once per year to regular occupants and addresses the following topics:
   1. Management of personal substance use, covering, at minimum, safe substance use habits, signs of dependency or addiction and short- and long-term health risks associated with substance misuse or addiction.[8,9 2.]
   2. Prescription opioid education, covering, at minimum, questions to ask at point of prescribing, safe use (e.g., storage, disposal, driving while using) and risks and signs of dependency or addiction.[9 3]
   3. How to appropriately respond to a peer struggling with substance use, covering, at minimum, how to support a peer's recovery efforts and what to do in the case of relapse or a substance use emergency (e.g., withdrawal, overdose).[8]

c. Training is provided in-person or virtually; in group or individual settings; through vendors, on-site staff, health insurance plans or programs, community groups or other qualified practitioners or programs (e.g., Mental Health First Aid).[10]

PART 2 PROVIDE SUBSTANCE USE AND ADDICTION SERVICES (MAX : 1 PT)

For All Spaces:

The following requirements are met for all eligible employees:

a. Substance use and addiction services are available at no cost or subsidized and include at a minimum:
   1. Clinical screening and referral to licensed mental health professionals and support resources.[7]
   2. Counseling services, including telemental health services (e.g., online behavioral therapy).[7]
   3. Outpatient treatment (e.g., day programs).[7]
   4. Inpatient treatment (e.g., residential programs, hospitalization).[7]
   5. Medication-assisted treatment (e.g., methadone treatment).[7]

b. Organizational commitment to mental health parity in health service coverage.[8]

c. Information on benefits coverage and how to access substance use and addiction services and community resources (e.g., peer support groups, online support groups) is easily and confidentially available (e.g., via a health portal or employee website).[7,8]

d. Confidential benefits consultation is available with clearly identified and qualified support staff (e.g., benefits counselor, human resources representative).

REFERENCES

1. Jorm AF. Mental health literacy; empowering the community to take action for better mental health. Am Psychol. 2012;67(3):231-243. doi:10.1037/a0025957
2. World Health Organization. Global Status Report on Alcohol and Health. Geneva, Switzerland; 2014.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

doi:/entity/substance_abuse/publications/global_alcohol_report/en/index.html

3. Anderson P. Alcohol and the workplace: a report on the impact of work place policies and programmes to reduce the harm done by alcohol to the economy. 2010;(June):1-16.
4. Bennett JB, Reynolds GS, Lehman WEK. Understanding employee alcohol and other drug use: Toward a multilevel approach. Prev Work Subst Abus Beyond drug Test to wellness. 2003:29-56. http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc4&NEWS=N&AN=2002-18429-001.
5. United Nations Office on Drugs and Crime. World Drug Report 2015. Vol 53. Geneva, Switzerland: Research and Trend Analysis Branch, Division for Policy Analysis and Public Affairs, United Nations Office on Drugs and Crime,; 2015. doi:10.1017/CBO9781107415324.004
6. World Health Organization. Alcohol. http://www.who.int/mediacentre/factsheets/fs349/en/. Published 2017. Accessed January 10, 2018.
7. Slavit WI, Reagin A, Finch RA. An Employer's Guide to Workplace Substance Abuse: Strategies and Treatment Recommendations. Washington, D.C; 2009. https://www.businessgrouphealth.org.
8. National Alliance on Mental Illness-NYC, Northeast Business Group on Health, Partnership for Workplace Mental Health/American Psychiatric Association Foundation, PricewaterhouseCoopers, The Kennedy Forum. Working Well: Leading a Mentally Healthy Business. New York City; 2016.
9. Teater D. The Proactive Role Employers Can Take: Opioids in the Workplace. 2014:16.
10. Centers for Disease Control and Prevention. The CDC Worksite Health ScoreCard: An Assessment Tool for Employers to Prevent Heart Disease, Stroke, and Related Health Conditions. Atlanta; 2014. https://www.cdc.gov/dhdsp/pubs/docs/hsc_manual.pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

COMMUNITY

The WELL Community concept aims to support access to essential healthcare, build a culture of health that accommodates a variety of population needs and establish an engaged occupant community.

Within every built space there exists a unique community of people with varied backgrounds who are linked by social ties, share common perspectives and engage in joint action and experiences in shared settings or locations.[1] The global, national and local conditions that impact the health of each individual in a community are known as the social determinants of health, which include physical determinants, or the physical and built conditions that impact health.[2,3] Determinants of health can influence health disparities, which are the differences in health status between population groups resulting from unequal distribution of power and resources as a function of gender, race, ethnicity or socio-economic status.[3] For example, many people worldwide still struggle with low health literacy and limited access to basic health services, which varies based on race, ethnicity, socioeconomic status, age, sex, disability status, sexual orientation, gender identity and residential location.[4,5,6,7,8] Additionally, an estimated 235 million urban families live in substandard housing, leading to poor health outcomes like asthma, infectious disease and cardiovascular events.[9–11,12,13,14] Policies and services that support working caregivers, like new parents, are critical to a supportive workplace culture of health, but are not universally provided.[15,16] Exclusive hiring and promotion practices also present barriers to advancement for specific populations: only 55% of U.S. companies report racial diversity as a priority, and in the UK, women's earnings are only 80.2% of men's.[17,18] Furthermore, built spaces vary greatly in how they are designed and operated, and because occupants may have a wide range of health needs and abilities, many environments are not designed with these differening requirements in mind.[19,20,21,22,23,24] 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.[25,26]

Promoting community well-being must begin with supporting the fundamental factors that influence individual and collective health. Providing increased and affordable access to comprehensive health services supports better individual and community health outcomes, reducing health disparities and overall healthcare costs.[2–4,27,28] Health promotion programs, from immunization programs and on-demand services to paid sick leave policies and incentive-based initiatives, can improve employee job satisfaction, self-esteem and overall health, while reducing health risks.[29,30,31] Collecting stakeholder input through charrettes and establishing health-oriented goals early on, and utilizing post-occupancy surveys to ask occupants about their satisfaction with their environment, can help a project identify and meet objectives that support the health of all stakeholders while bringing employers significant returns on investment.[25,32,19,52, 35–37,59,38]Furthermore, supporting working caregivers through strategies like childcare support, workplace breastfeeding support, and paid parental leave can provide numerous benefits, including higher rates of breastfeeding, reduced infant mortality and long-term achievement for children.[39,40,41–46,47] Companies that foster civic engagement and espouse fair and just treatment toward their workforce can increase employee attraction and retention, and improve financial returns, while building a supportive culture.[48,49]Establishing an emergency management plan, and providing emergency resources like AEDs, first aid kits and preparedness trainings, is crucial to collective safety during emergencies.[50]Creating plans to support business continuity, remote work readiness and project re-entry after extended remote periods helps maintain business resilience and individual well-being during and after longer-lasting emergencies.[51,52]

In addition to health-promoting policies and programs, design plays a critical role in addressing the physical determinants of health and making buildings accessible and safe for all. Supportive spaces both comply with accessibility codes and also incorporate universal design principles that enable people of all needs, abilities and identities to use a space.[53]Finally, incorporating affordable housing units can help improve overall health and provide a stable platform for the delivery of essential services for low-income populations.[9,11,13,14,54]

The WELL Community concept promotes the implementation of design, policy and operations strategies that focus on addressing health disparities and establishing a culture of health. Providing access to health services, supportive and health-promoting policies, and design that enables all individuals to access, participate and thrive within a space can build a foundation for healthy communities.

Note : Read more about the evidence behind the WELL Community Concept. Note: Material from the research digests is not covered on the WELL AP exam.

REFERENCES

1. MacQueen KM, McLellan E, Metzger DS, et al. What is community? An evidence-based definition for participatory public health. Am J Public Health. 2001;91(12):1929-1938. doi:10.2105/AJPH.91.12.1929

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

2. World Health Organization. About social determinants of health. http://www.who.int/social_determinants/sdh_definition/en/. Published 2017. Accessed January 30, 2018.
3. U.S. Department of Health and Human Services. Healthy People 2020: Social Determinants of Health. https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health. Accessed February 7, 2018.
4. U.S. Department of Health and Human Services. Access to Health Services | Healthy People 2020. https://www.healthypeople.gov/2020/topics-objectives/topic/Access-to-Health-Services. Accessed February 4, 2018.
5. Institute of Medicine. Health Literacy: A Prescription to End Confusion. Washington, D.C.: National Academies Press; 2004. doi:10.17226/10883
6. World Health Organization. Health literacy: The solid facts. 2013. http://www.euro.who.int/__data/assets/pdf_file/0008/190655/e96854.pdf.
7. U.S. Department of Health and Human Services. National Action Plan to Improve Health Literacy. 2010. https://health.gov/communication/hlactionplan/pdf/Health_Literacy_Action_Plan.pdf.
8. National Institutes of Health. Improving Health Literacy Surgeon General's Workshop on Improving Health Literacy. 2006. https://www.ncbi.nlm.nih.gov/books/NBK44257/pdf/Bookshelf_NBK44257.pdf.
9. Housing Instability | Healthy People 2020.
10. Health Impact Assessment and Housing | The Pew Charitable Trusts.
11. Maqbool N, Viveiros J, Ault M. The Impacts of Affordable Housing on Health : A Research Summary.; 2007.
12. Woetzel J, Ram S, Mischke J, Garemo N, Sankhe S. A Blueprint for Addressing the Global Affordable Housing Challenge.; 2014.
13. The Positive Impacts of Affordable Housing on Health: A Research Summary | Enterprise Community Partners.
14. Taylor L. "Housing And Health: An Overview Of The Literature, " Health Affairs Health Policy Brief. Health Aff. 2018. doi:10.1377/hpb20180313.396577
15. World Policy Analysis Center. Is paid leave available to mothers and fathers of infants? https://www.worldpolicycenter.org/policies/is-paid-leave-available-to-mothers-and-fathers-of-infants/is-paid-leave-available-for-mothers-of-infants. Accessed January 15, 2018.
16. World Health Organization. Facts about ageing. http://www.who.int/ageing/about/facts/en/. Published 2015. Accessed February 8, 2018.
17. McKinsey & Company. Women in the Workplace 2016. New York, NY; 2016. http://womenintheworkplace.com/ui/pdfs/Women_in_the_Workplace_2015.pdf?v=5.
18. The B Team. The Diversity Paradox: Capturing the Value of Difference by Looking Beyond the Numbers. The B Team; 2015.
19. Health Enhancement Research Organization, American College of Occupational and Environmental Medicine, Care Continuum Alliance. Biometric Health Screening for Employers. J Occup Environ Med. 2013;55(10):1244-1251. doi:10.1097/JOM.0b013e3182a7e975
20. Heylighen A. About the nature of design in universal design. Disabil Rehabil. 2014;36(16):1360-1368. doi:10.3109/09638288.2014.932850
21. World Health Organization. World Report on Disability. 2011. http://apps.who.int/iris/bitstream/10665/70670/1/WHO_NMH_VIP_11.01_eng.pdf.
22. World Health Organization. Ageing and health. https://www.who.int/news-room/fact-sheets/detail/ageing-and-health. Published 2018. Accessed July 2, 2020.
23. Mind.org. Mental Health Facts and Statistics. https://www.mind.org.uk/information-support/types-of-mental-health-problems/statistics-and-facts-about-mental-health/introduction-to-statistics/. Published 2017. Accessed July 2, 2020.
24. U.S. Department of Health and Human Science Services: Office of Disease Prevention and Health Promotion. Disability and Health: Overview. Healthy People 2020. https://www.healthypeople.gov/2020/topics-objectives/topic/disability-and-health. Accessed April 18, 2018.
25. U.S. Environmental Protection Agency. Creating Equitable, Healthy, and Sustainable Communities: Strategies for Advancing Smart Growth, Environmental Justice, and Equitable Development. 2013. https://www.epa.gov/sites/production/files/2014-01/documents/equitable-development-report-508-

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

011713b.pdf.

26. Gochfeld M, Burger J. Disproportionate Exposures in Environmental Justice and Other Populations: The Importance of Outliers. Am J Public Health. 2011;101. doi:10.2105/AJPH
27. World Health Organization. Workers' health: Global Plan of Action - Sixtieth World Health Assembly. Presented at the: 2007. http://www.who.int/occupational_health/WHO_health_assembly_en_web.pdf.
28. World Health Organization. Health Systems Financing: The Path to Universal Coverage.; 2010. https://www.who.int/whr/2010/whr10_en.pdf. Accessed August 5, 2019.
29. Centers for Disease Control and Prevention. Workplace Health Model | Workplace Health Promotion. https://www.cdc.gov/workplacehealthpromotion/model/index.html. Accessed February 4, 2018.
30. World Health Organization. Workplace health promotion. http://www.who.int/occupational_health/topics/workplace/en/. Published 2010. Accessed February 4, 2018.
31. The Community Preventive Services Task Force. Worksite: Seasonal Influenza Vaccinations Using Interventions with On-Site, Free, Actively Promoted Vaccinations – Healthcare Workers. http://www.thecommunityguide.org/worksite/flu-hcw.html. Published 2008. Accessed April 2, 2018.
32. Community Planning Toolkit - Community Engagement. Belfast; 2014. www.communityplanningtoolkit.org. Accessed August 6, 2019.
33. Higgins C, Lyons S. Reducing Work–Life Conflict: What Works? What Doesn't?; 2003. https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/occupational-health-safety/reducing-work-life-conflict-what-works-what-doesn.html.
34. Schrah G. Employee Pulse Study: How happy is the US workforce? | Qualtrics. Qualtrics Global Employee Pulse. https://www.qualtrics.com/employee-pulse/#section1. Published 2017. Accessed August 14, 2019.
35. Frontczak M, Schiavon S, Goins J, Arens E, Zhang H, Wargocki P. Quantitative relationships between occupant satisfaction and satisfaction aspects of indoor environmental quality and building design. Indoor Air. 2012;22(2):119-131. doi:10.1111/j.1600-0668.2011.00745.x
36. Turpin-Brooks S, Viccars G. The development of robust methods of post occupancy evaluation. Facilities. 2006;24(5-6):177-196. doi:10.1108/02632770610665775
37. Frankfort-Nachmias C, Nachmias D, DeWaard J. Research Methods in the Social Sciences. In: 8th ed. New York, NY: Worth Publishers; 2015.
38. Hebert PR, Chaney S. Using end-user surveys to enhance facilities design and management. Facilities. 2012;30(11/12):458-471. doi:10.1108/02632771211252306
39. Canadian Centre for Occupational Health and Safety. Work/Life Balance. http://www.ccohs.ca/oshanswers/psychosocial/worklife_balance.html. Accessed December 15, 2017.
40. Rossin-Slater M. Maternity and Family Leave Policy.; 2017. http://www.nber.org/papers/w23069.
41. Burtle A, Bezruchka S. Population Health and Paid Parental Leave: What the United States Can Learn from Two Decades of Research. Healthcare. 2016;4(2):30. doi:10.3390/healthcare4020030
42. Nepomnyaschy L, Waldfogel J. Paternity leave and fathers' involvement with their young children. Community, Work Fam. 2007;10(4):427-453. doi:10.1080/13668800701575077
43. Tanaka S, Waldfogel J. Effects of parental leave and work hours on fathers' involvement with their babies. Community, Work Fam. 2007;10(4):409-426. doi:10.1080/13668800701575069
44. Chatterji P, Markowitz S. Does the length of maternity leave affect maternal health? South Econ J. 2005;72(1):16. doi:10.1017/CBO9781107415324.004
45. Carneiro P, Løken K V., Salvanes KG. A Flying Start? Maternity Leave Benefits and Long-Run Outcomes of Children. J Polit Econ. 2015;123(2):365-412. doi:10.1086/679627
46. Tanaka S. Parental leave and child health across OECD countries. Econ J. 2005;115(501):F7-F28. doi:10.1111/j.0013-0133.2005.00970.x
47. Schulte B, Durana A, Stout B, Moyer J. Paid Family Leave: How Much Time Is Enough?; 2017. https://www.newamerica.org/better-life-lab/reports/paid-family-leave-how-much-time-enough/. Accessed August 5, 2019.
48. Lev B, Petrovits C, Radhakrishnan S. Is doing good good for you? How corporate charitable contributions enhance revenue growth. Strateg Manag J. 2010;31(2):182-200. doi:10.1002/smj.810
49. The B Team. Diversity: Bringing the Business Case to life. 2015. http://www.bteam.org/original-content/diversity-

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

bringing-business-case-life/.

50. Berryman P, Lukes E, Mancini ME, Cazzell M, Kardong-Edgren S, Cason CL. Improving Workplace Safety Training Using a Self-Directed CPR-AED Learning Program. AAOHN J. 2009;57(4):159-167. doi:10.3928/08910162-20090401-02
51. Business Continuity Plan | Ready.gov. https://www.ready.gov/business-continuity-plan. Published 2020. Accessed May 29, 2020.
52. Goldman SB. PANDEMIC MANUAL Planning and Responding to a Global Health Crisis for Facility Management Professionals.; 2020. www.ifmafoundation.org. Accessed June 4, 2020.
53. Persson H, Åhman H, Yngling AA, Gulliksen J. Universal design, inclusive design, accessible design, design for all: different concepts—one goal? On the concept of accessibility—historical, methodological and philosophical aspects. Univers Access Inf Soc. 2015;14(4):505-526. doi:10.1007/s10209-014-0358-z
54. Kottke T, Abariotes A, Spoonheim JB. Access to Affordable Housing Promotes Health and Well-Being and Reduces Hospital Visits. Perm J. 2017;22. doi:10.7812/TPP/17-079

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C01 HEALTH AND WELL-BEING PROMOTION | P

Intent : Promote a deeper occupant understanding of the WELL features pursued by the project or organization and how building design, operations and policies impact health and well-being.

Summary : This WELL feature requires projects to provide a guide to occupants that highlights the WELL features pursued by the project, the relationship between health and buildings and available health resources and programs.

Issue : Health literacy refers to a person's cognitive and social ability to access, interpret and understand basic health information, as well as the ability to act on that understanding to maintain health.[1–4] Health literacy is influenced by sociocultural factors, such as age, socioeconomic status, mental health, cultural background, language and communication abilities, prior health experiences and how healthcare delivery and education systems deliver care, health information and health education.[1] Low health literacy is linked to lower use of preventive care (e.g., flu shots), poor management of chronic conditions (e.g., high blood pressure) and lower self-reported mental and physical health.[5,6] Studies estimate that low health literacy costs the U.S. economy anywhere between $70-240 billion each year.[5,7]

Solutions : Multi-modal programming, educational materials and communications can help promote health literacy and increase positive health outcomes. [8,9]By supporting awareness of health and wellness programs and policies, projects can promote health literacy and encourage engagement with health resources, leading to both individual benefits - like increased participation in healthy behaviors and use of health services - and also employer benefits, providing an estimated 4:1 return on investment.[5,10]

PART 1 PROVIDE WELL FEATURE GUIDE

For All Spaces:

1: WELL feature guide

A physical or digital WELL feature guide, such as the WELL report, will be prominently displayed and/or made widely available to all occupants upon certification achievement or completion of a review cycle, meeting the following requirements:

a. Describes the WELL features achieved by the project or organization.

2: Communications

The following requirement is met:

a. Quarterly communications (e.g., emails, modules, trainings) are sent to regular occupants, and onboarding communications are given to new employees (as applicable), about health resources, programs, amenities and policies available to them addressed by the WELL features achieved by the project or organization.

REFERENCES

1. Sundhedsstyrelsen. Health Literacy: A Perscription to End Confusion. Washington, D.C.: National Academies Press; 2009. doi:10.17226/10883
2. Nutbeam D. The evolving concept of health literacy. Off Provost. 2008. doi:10.1016/j.socscimed.2008.09.050
3. Peerson A, Saunders M. Health literacy revisited: what do we mean and why does it matter? Health Promot Int. 2009;24(3):285-296. doi:10.1093/heapro/dap014
4. Poureslami I, Nimmon L, Rootman I, Fitzgerald MJ. Priorities for Action: Recommendations from an international roundtable on health literacy and chronic disease management. Health Promot Int. 2017;32(4):743-754. doi:10.1093/heapro/daw003
5. World Health Organization. Health literacy: The solid facts. 2013. http://www.euro.who.int/__data/assets/pdf_file/0008/190655/e96854.pdf.
6. National Institutes of Health. Improving Health Literacy Surgeon General's Workshop on Improving Health Literacy. 2006. https://www.ncbi.nlm.nih.gov/books/NBK44257/pdf/Bookshelf_NBK44257.pdf.
7. Vernon JA, Trujillo A, Rosenbaum S, Debuono B. Low Health Literacy: Implications for National Health Policy.
8. Schaller A, Dejonghe L, Alayli-Goebbels A, Biallas B, Froboese I. Promoting physical activity and health literacy: study protocol for a longitudinal, mixed methods evaluation of a cross-provider workplace-related intervention in Germany (The AtRisk study). BMC Public Health. 2016;16:626. doi:10.1186/s12889-016-3284-6
9. Das S, Mia MN, Hanifi SMA, Hoque S, Bhuiya A. Health literacy in a community with low levels of education: findings from Chakaria, a rural area of Bangladesh. BMC Public Health. 2017;17(1):203. doi:10.1186/s12889-017-4097-y
10. Cho YI, Lee S-YD, Arozullah AM, Crittenden KS. Effects of health literacy on health status and health service utilization amongst the elderly. Soc Sci Med. 2008;66(8):1809-1816. doi:10.1016/J.SOCSCIMED.2008.01.003

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C02 INTEGRATIVE DESIGN | P

Intent : Facilitate a collaborative project process and support adherence to collective well-being and sustainability goals.

Summary : This WELL feature requires project teams to facilitate a collaborative planning and orientation process and to establish a health-oriented mission.

Issue : Projects that do not consult stakeholders during planning and development processes often do not serve stakeholder needs and may even negatively impact the health and well-being of certain populations.[1,2] In particular, studies show that low-income and minority populations are most often excluded from planning discussions and decision-making, leading to developments that do not address their needs and may even increase their exposure to poor health conditions, displacement, pollution, crime and lack of access to opportunities and services.[1,2]

Solutions : Engaging stakeholders from a variety of backgrounds from the onset of the planning process creates the opportunity for collaborative dialogue between key decision-makers, planners and individuals who will be impacted by the project. Collecting varied stakeholder input can help a project identify and address its essential goals for health promotion and incorporate design that best celebrates the project's unique identity, culture and place, creating a space that meets the needs of all stakeholders and enriches the well-being of both occupants and visitors.[1,3,4] Establishing a health-centered mission and orienting stakeholders to how the project will adhere to that mission through design and operations, including WELL features, can help individuals remain engaged in the space and empower them to utilize all available health and wellness programs and policies.[5]

PART 1 FACILITATE STAKEHOLDER CHARRETTE

For All Spaces:

1: Stakeholder charrette

Early in the planning process for the pursuit of a WELL designation, representatives from the organization or project team (e.g., leadership, human resources, project managers) facilitate a collaborative discussion that meets the following requirements:

a. Includes representative key stakeholders including (as applicable):
    1. Owner.
    2. Facilities manager.
    3. Architects and engineers.
    4. Contractors.
    5. Employees or other occupants.
    6. Community members (if the project or organization has substantial impact on the surrounding community).
b. Identifies the health and well-being needs of your occupants.
c. Identifies your organization's objectives for health promotion.
d. Defines goals, related to each of the following:
    1. Occupant health and well-being.
    2. Resilience.
    3. Energy and resource management.
    4. Protection of water resources and ecosystems.
    5. Healthy and sustainable material cycles.
    6. Community inclusion.
    7. Clean and healthful local environments.

2: Stakeholder orientation

Tours of the space, communicating existing building operations, maintenance, programs and policies support adherence to WELL requirements, are conducted and made available to the following groups:

a. All stakeholders in the development process, including (as applicable) the owner, manager, facilities management team, architects, engineers, existing employees, occupants, residents, contractors and community members.
b. New employees during onboarding.

PART 2 PROMOTE HEALTH-ORIENTED MISSION

For All Spaces:

The project or organization establishes a health-oriented mission that meets the following requirements:

a. Outlines the project's or organization's objectives for health promotion.[5]
b. Includes a statement about supporting and improving occupant health.[5]
c. Incorporates relevant organizational goals or strategies established during the stakeholder charrette.
d. Is made available to all occupants.

REFERENCES

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

1. U.S. Environmental Protection Agency. Creating Equitable, Healthy, and Sustainable Communities: Strategies for Advancing Smart Growth, Environmental Justice, and Equitable Development. 2013. https://www.epa.gov/sites/production/files/2014-01/documents/equitable-development-report-508-011713b.pdf.
2. Gochfeld M, Burger J. Disproportionate Exposures in Environmental Justice and Other Populations: The Importance of Outliers. Am J Public Health. 2011;101. doi:10.2105/AJPH
3. Community Planning Toolkit - Community Engagement. Belfast; 2014. www.communityplanningtoolkit.org. Accessed August 6, 2019.
4. Ivanaj V, Shrivastava P, Ivanaj S. The value of beauty for organizations. J Clean Prod. 2018;189. doi:10.1016/j.jclepro.2018.04.122
5. Centers for Disease Control and Prevention. The CDC Worksite Health ScoreCard: An Assessment Tool for Employers to Prevent Heart Disease, Stroke, and Related Health Conditions. 2014. https://www.cdc.gov/dhdsp/pubs/docs/hsc_manual.pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C03 EMERGENCY PREPAREDNESS | P

Intent : Enable organizations, families and individuals to prepare and respond to a variety of emergency situations.

Summary : This WELL feature requires projects to undertake a risk assessment, create an emergency management plan for natural, human-caused, technological and health-related emergencies and educate occupants on the plan to support emergency preparedness and response.

Issue : Natural disasters kill around 90,000 people and affect close to 160 million people worldwide every year, with both an immediate and long-term impact on human lives and built spaces.1 Older adults, individuals with disabilities, pregnant women and children may have special needs during an emergency and are particularly vulnerable when disaster strikes.1 The U.S. Federal Emergency Management Agency estimates about 40-60% of small businesses permanently close following a disaster due to the lack of a comprehensive disaster preparedness plan with proper mitigation strategies.2 Beyond natural disasters, infectious disease epidemics have increased in the 21st century, involving rapid global spread due to travel, trade and urbanization.3,4 The COVID-19 pandemic infected six million people and spread to almost every continent within five months, impacting the social and economic livelihood of the global population on an incalculable scale.5

Solutions : An effective emergency management plan requires an understanding of potential local hazards, the needs of vulnerable groups, the responsibilities of the emergency response team and building response capabilities.6 Emergency management plans, including risk assessments, occupant drills and enhanced emergency communications, can help organizations be better prepared to handle unforeseen events, minimize occupant confusion and improve coordination and safety during emergency situations.3,7–11 Robust emergency preparedness and response measures can also help to slow the spread of infectious disease and minimize secondary mortality.12

PART 1 DEVELOP EMERGENCY PREPAREDNESS PLAN

For All Spaces:

The following requirements are met:

a. A risk assessment is undertaken to address at minimum the following:
    1. Identify project assets (e.g., employees, facilities).
    2. Establish a process for occupants or groups who may be more vulnerable (e.g., older adults, people with disabilities, pregnant women, children) to confidentially identify specific needs they may have during an emergency.[13]
    3. Evaluate potential impacts of relevant hazards and identify high-risk hazards.
    4. Determine emergency management planning priorities.
b. An emergency management plan is in place outlining response in the case of emergency situations within the building or surrounding community, addressing at minimum the following hazards:
    1. Natural (e.g., flood, tsunami, wildfire, earthquake, heatwave).
    2. Fire.
    3. Health (e.g., acute medical emergency, infectious disease pandemic).
    4. Technological (e.g., power loss, chemical spill, explosion).
    5. Human-caused (e.g., civil unrest, active shooter, terrorism).
c. The emergency management plan meets the following requirements:
    1. Incorporates annual (at minimum) inventory and maintenance of building emergency response resources (e.g., first aid kits, automated external defibrillators (AEDs), emergency notification system, personal protective equipment) and operations capabilities (e.g., backup power, remote management systems).
    2. Includes a list of specialized personnel that is updated annually (at minimum) and includes roles and contact information of the emergency response team.[13]
    3. Plan is reviewed and updated (as needed) on an annual basis and is easily accessible to all regular occupants.
d. Regular occupants are provided education and training on emergency preparedness and response, including the following:
    1. Communications about the emergency management plan and related resources, including guidance by relevant local-, state-, regional- or global-level emergency response agencies (e.g., WHO, government emergency management agency or equivalent), annually (at minimum), to employees during new employee onboarding and during an emergency event.
    2. Practice drills or other operations-based or discussion-based exercises conducted annually (at minimum) for each high-risk hazard identified in the risk assessment, and conducted every two years (at minimum) for other hazards covered under the emergency management plan.[13]

REFERENCES

1. WHO. Environmental health in emergencies : Vulnerable groups. Public Health Management of Chemical Incidents.
2. Mike S. Make Your Business Resilient.
3. World Health Organization. Managing Epidemics.; 2018. https://www.who.int/emergencies/diseases/managing-epidemics-interactive.pdf. Accessed June 3, 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

4. World Health Organization. WHO's Work in Emergencies: Prepare, Prevent, Detect and Respond - Annual Report 2018. World Health Organization; 2018. https://www.who.int/emergencies/who-work-in-emergencies/en/. Accessed June 3, 2020.
5. World Health Organization. Coronavirus Disease (COVID-19) Situation Report - 134.; 2020. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200602-covid-19-sitrep-134.pdf?sfvrsn=cc95e5d5_2. Accessed June 3, 2020.
6. Occupational Health and Safety Administration. How to Plan for Workplace Emergencies and Evacuations. 2001.
7. Lockwood NR. Crisis Management in Today's Business Environment: HR's Strategic Role.; 2005. https://www.shrm.org/hr-today/news/hr-magazine/Documents/1205RQuartpdf.pdf. Accessed October 21, 2019.
8. Skryabina E, Reedy G, Amlôt R, Jaye P, Riley P. What is the value of health emergency preparedness exercises? A scoping review study. Int J Disaster Risk Reduct. 2017;21:274-283. doi:10.1016/j.ijdrr.2016.12.010
9. Occupational Safety and Health Administration. Evacuation Plans and Procedures eTool | Emergency Action Plan - Develop & Implement an Emergency Action Plan (EAP). https://www.osha.gov/SLTC/etools/evacuation/implementation.html. Accessed June 3, 2020.
10. American Red Cross Ready Rating. SMB Prepared Playbook. 2015. https://www.readyrating.org/Resource-Center/All-Resources/smb-prepared-playbook. Accessed June 4, 2020.
11. U.S. Small Business Administration. Disaster Preparedness and Recovery Plan.; 2019. https://www.sba.gov/sites/default/files/2019-08/2019 DPRP 3-2b-FINAL.pdf. Accessed June 4, 2020.
12. World Health Organization. COVID-19 Strategy Update - 14 April 2020.; 2020. https://www.who.int/publications-detail/covid-19-strategy-update---14-april-2020. Accessed June 3, 2020.
13. Centers for Disease Control and Prevention (CDC). (2015). Planning for an emergency: Strategies for identifying and engaging at-risk groups. A guidance document for emergency managers. https://www.cdc.gov/nceh/hsb/disaster/atriskguidance.pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C04 OCCUPANT SURVEY | P

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

Summary : This WELL 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, particularly on topics related to WELL strategies.

Issue : Given the wide variation in how built spaces are designed, operated and used, it is difficult to identify which design, policy and programmatic approaches will benefit the health and well-being of the greatest number of individuals in a space.[1,2] For example, decision-makers and users of the space often experience things differently.[1] 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.[3,4,5]

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.[6–8] Psychometrically validated surveys and questions ensure that sensitive questions are framed appropriately and measure what they are intended to measure, and when combined with environmental satisfaction questions can effectively capture high-quality data.[9–12] 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.[3,5] 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.[5,12–14]

PART 1 SELECT PROJECT SURVEY

For All Spaces:

Option 1: Pre-approved survey

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

Option 2: Custom survey

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

a. A survey is created that covers the topics listed in Appendix C1.

OR

Option 3: Small employee population

The following requirement is met:

a. There are fewer than 10 eligible employees in this project.

PART 2 ADMINISTER ANNUAL SURVEY AND REPORT RESULTS

For All Spaces:

1: Survey administration

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.

2: Result reporting

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 Health-Safety Rated).

b.

Aggregated, anonymized survey results.

REFERENCES

1. Health Enhancement Research Organization, American College of Occupational and Environmental Medicine,

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

Care Continuum Alliance. Biometric Health Screening for Employers. J Occup Environ Med. 2013;55(10):1244-1251. doi:10.1097/JOM.0b013e3182a7e975

2. Heylighen A. About the nature of design in universal design. Disabil Rehabil. 2014;36(16):1360-1368. doi:10.3109/09638288.2014.932850
3. Baicker K, Cutler D, Song Z. Workplace Wellness Programs Can Generate Savings. Health Aff. 2010;29(2):304-311. doi:10.1377/hlthaff.2009.0626
4. Geng Y, Ji W, Lin B, Zhu Y. The impact of thermal environment on occupant IEQ perception and productivity. Build Environ. 2017;121:158-167. doi:10.1016/J.BUILDENV.2017.05.022
5. Schrah G. Employee Pulse Study: How happy is the US workforce? | Qualtrics. Qualtrics Global Employee Pulse. https://www.qualtrics.com/employee-pulse/#section1. Published 2017. Accessed August 14, 2019.
6. Frontczak M, Schiavon S, Goins J, Arens E, Zhang H, Wargocki P. Quantitative relationships between occupant satisfaction and satisfaction aspects of indoor environmental quality and building design. Indoor Air. 2012;22(2):119-131. doi:10.1111/j.1600-0668.2011.00745.x
7. Turpin-Brooks S, Viccars G. The development of robust methods of post occupancy evaluation. Facilities. 2006;24(5-6):177-196. doi:10.1108/02632770610665775
8. Frankfort-Nachmias C, Nachmias D, DeWaard J. Research Methods in the Social Sciences. In: 8th ed. New York, NY: Worth Publishers; 2015.
9. de Souza AC, Alexandre NMC, Guirardello E de B. Propriedades psicométricas na avaliação de instrumentos: avaliação da confiabilidade e da validade. Epidemiol e Serviços Saúde. 2017;26(3):649-659. doi:10.5123/S1679-49742017000300022
10. McHorney CA, Ware JE, Raczek AE. The MOS 36-item short-form health survey (Sf-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. Med Care. 1993;31(3):247-263. doi:10.1097/00005650-199303000-00006
11. Elijah-Barnwell S, Friedow B. Development and Psychometric Testing of a Post-Occupancy Evaluation. HERD Heal Environ Res Des J. 2014;8(1):115-121. doi:10.1177/193758671400800109
12. Higgins C, Lyons S. Reducing Work–Life Conflict: What Works? What Doesn't?; 2003. https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/occupational-health-safety/reducing-work-life-conflict-what-works-what-doesn.html.
13. Hebert PR, Chaney S. Using end-user surveys to enhance facilities design and management. Facilities. 2012;30(11):458-471. doi:10.1108/02632771211252306
14. Loeppke R. Biometric Health Screening for Employers: Consensus Statement of the Health Enhancement Research Organization, American College of Occupational and Environmental Medicine, and Care Continuum Alliance. J Occup Environ Med. 2013;55(10):1244-1251. doi:10.1097/JOM.0b013e3182a7e975

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C05 ENHANCED OCCUPANT SURVEY | O (MAX : 4 PT)

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

Summary : This WELL 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 health, well-being and satisfaction with their environment including topics related to WELL strategies, both before and during occupancy.

Issue : Given the wide variation in how built spaces are designed, operated and used, it's difficult to idetify which design, policy and programmatic approaches will benefit the health and well-being of the greatest number of individuals in a space.[1,2] For example, decision-makers and users of the space often experience things differently.[1] 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.[3,4,5]

Solutions : Occupancy surveys measure the extent to which a building promotes user health and comfort. [6–8,9–11] Specifically, psychometrically validated surveys evaluate building users' experience, frame sensitive questions appropriately and measure what they are intended to measure.[12,13] 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.[11,14,15] Moreover, interviews and focus groups provide key insights not captured in surveys.[16,17,18] Stakeholders can use results to identify priority interventions to make spaces healthier and more productive. [19] Offering the opportunity to provide feedback, along with an action plan to address dissatisfaction, can improve employee morale and retention while creating a healthier environment for all.[5,20,21,22–25]

PART 1 UTILIZE ENHANCED SURVEY (MAX : 1 PT)

For All Spaces:

1: Enhanced survey administration

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

a. Meet Feature C04 Part 1 using a third-party or pre-approved survey provider.

b. Address at least one of the topics listed in Appendix C2 through a minimum of three additional survey questions utilizing a pre-approved survey provider listed on Reference.

2: Result analysis and reporting

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 from Appendix C2.
   2. Results of enhanced analysis.

PART 2 UTILIZE PRE- AND POST-OCCUPANCY SURVEY (MAX : 1 PT)

For All Spaces:

1: Baseline and annual survey administration

The project or organization meets the following requirement:

a. Prior to achieving a WELL milestone, administer a survey for eligible employees using the same Reference that will be used for Feature C04.

2: Result analysis and reporting

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 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, each time it was administered.
   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 a minimum).

Note :

Additional baseline survey is not required at recertification.

PART 3 IMPLEMENT ACTION PLAN (MAX : 1 PT)

For All Spaces:

1: Satisfaction Targets

The project or organization creates and implements a plan that addresses the following:

a. Defines target satisfaction levels reported in the annual survey.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

2: Improvement Strategies

The project or organization submits on an annual basis:

a. Comparison of satisfaction results to aspirational targets.

b. Improvement strategies to be implemented, if applicable.

PART 4 FACILITATE INTERVIEWS, FOCUS GROUPS AND/OR OBSERVATIONS (MAX : 1 PT)

For All Spaces:

1: Administration of interviews, focus groups and/or observations

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.

2: Result analysis and reporting

The project or organization meets the following requirements:

a. Compare results from the evaluations to the survey results, if applicable.

b. Annually submit aggregated, anonymized results of the evaluations through the platform on the following:

   1. Comparison between the results of the evaluations and the survey results, as applicable.
   2. Total number of employees and number of employees who participated in the evaluations.
   3. Date the evaluations started and finished.
   4. Project location(s).
   5. Project type(s).
   6. Level of WELL achievement, if applicable.
   7. Sociodemographic information of participants (age and gender at a minimum).

REFERENCES

1. Health Enhancement Research Organization, American College of Occupational and Environmental Medicine, Care Continuum Alliance. Biometric Health Screening for Employers. J Occup Environ Med. 2013;55(10):1244-1251. doi:10.1097/JOM.0b013e3182a7e975
2. Heylighen A. About the nature of design in universal design. Disabil Rehabil. 2014;36(16):1360-1368. doi:10.3109/09638288.2014.932850
3. Baicker K, Cutler D, Song Z. Workplace Wellness Programs Can Generate Savings. Health Aff. 2010;29(2):304-311. doi:10.1377/hlthaff.2009.0626
4. Geng Y, Ji W, Lin B, Zhu Y. The impact of thermal environment on occupant IEQ perception and productivity. Build Environ. 2017;121:158-167. doi:10.1016/J.BUILDENV.2017.05.022
5. Schrah G. Employee Pulse Study: How happy is the US workforce? | Qualtrics. Qualtrics Global Employee Pulse. https://www.qualtrics.com/employee-pulse/#section1. Published 2017. Accessed August 14, 2019.
6. Frontczak M, Schiavon S, Goins J, Arens E, Zhang H, Wargocki P. Quantitative relationships between occupant satisfaction and satisfaction aspects of indoor environmental quality and building design. Indoor Air. 2012;22(2):119-131. doi:10.1111/j.1600-0668.2011.00745.x
7. Turpin-Brooks S, Viccars G. The development of robust methods of post occupancy evaluation. Facilities. 2006;24(5-6):177-196. doi:10.1108/02632770610665775
8. Frankfort-Nachmias C, Nachmias D, DeWaard J. Research Methods in the Social Sciences. In: 8th ed. New York, NY: Worth Publishers; 2015.
9. Mustafa FA. Performance assessment of buildings via post-occupancy evaluation: A case study of the building of the architecture and software engineering departments in Salahaddin University-Erbil, Iraq. Front Archit Res. 2017;6(3):412-429. doi:10.1016/j.foar.2017.06.004
10. Hebert PR, Chaney S. Using end-user surveys to enhance facilities design and management. Facilities. 2012;30(11/12):458-471. doi:10.1108/02632771211252306
11. Engelen L, Dhillon HM, Chau JY, Hespe D, Bauman AE. Do active design buildings change health behaviour and

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

workplace perceptions? Occup Med (Chic Ill). 2016;66(5):408-411. doi:10.1093/occmed/kqv213

12. de Souza AC, Alexandre NMC, Guirardello E de B. Propriedades psicométricas na avaliação de instrumentos: avaliação da confiabilidade e da validade. Epidemiol e Serviços Saúde. 2017;26(3):649-659. doi:10.5123/S1679-49742017000300022
13. McHorney CA, Ware JE, Raczek AE. The MOS 36-item short-form health survey (Sf-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. Med Care. 1993;31(3):247-263. doi:10.1097/00005650-199303000-00006
14. Agha-Hossein MM, El-Jouzi S, Elmualim AA, Ellis J, Williams M. Post-occupancy studies of an office environment: Energy performance and occupants' satisfaction. Build Environ. 2013;69:121-130. doi:10.1016/j.buildenv.2013.08.003
15. Leaman A, Stevenson F, Bordass B. Building evaluation: Practice and principles. Build Res Inf. 2010;38(5):564-577. doi:10.1080/09613218.2010.495217
16. Barnett-Page E, Thomas J. Methods for the synthesis of qualitative research: A critical review. BMC Med Res Methodol. 2009;9(1):59. doi:10.1186/1471-2288-9-59
17. Limb M, Dwyer C. Qualitative Methodologies for Geographers: Issues and Debates. London: Arnold; 2001. https://lib.ugent.be/en/catalog/rug01:000740819.
18. Baxter J, Eyles J. Evaluating qualitative research in social geography: Establishing "rigour" in interview analysis. Trans Inst Br Geogr. 1997;22(4):505-525. doi:10.1111/j.0020-2754.1997.00505.x
19. Loeppke R. Biometric Health Screening for Employers: Consensus Statement of the Health Enhancement Research Organization, American College of Occupational and Environmental Medicine, and Care Continuum Alliance. J Occup Environ Med. 2013;55(10):1244-1251. doi:10.1097/JOM.0b013e3182a7e975
20. Research S. The Impact of Equality and Values Driven Business.; 2017.
21. Nigam A, Tétreault K, Leblanc M-C, Renaud L, Kishchuk N, Juneau M. Implementation and Outcomes of a Comprehensive Worksite Health Promotion Program. Vol 99.
22. MacNaughton P, Pegues J, Satish U, Santanam S, Spengler J, Allen J. Economic, environmental and health implications of enhanced ventilation in office buildings. Int J Environ Res Public Health. 2015;12(11):14709-14722. doi:10.3390/ijerph121114709
23. Attema JE, Fowell SJ, Macko MJ, Neilson WC. The Financial Case for HIgh Performance Buildings.; 2018.
24. Stewart WF, Ricci JA, Chee E, Hahn SR, Morganstein D. Cost of Lost Productive Work Time among US Workers with Depression. J Am Med Assoc. 2003;289(23):3135-3144. doi:10.1001/jama.289.23.3135
25. Health, Wellbeing & Productivity in Offices The next Chapter for Green Building.; 2014.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C06 HEALTH SERVICES AND BENEFITS | O (MAX : 5 PT)

Intent : Support the overall health and well-being of individuals and their families by offering comprehensive health benefits, policies and services.

Summary : This WELL feature requires projects to provide access to essential and on-demand health services, paid sick leave and immunizations.

Issue : Access to basic healthcare services is one of five key pillars that form the social determinants of health. [1] Access includes physical or geographic access, affordability, and quality or acceptability of care, and access varies based on race, ethnicity, socioeconomic status, age, sex, disability status, sexual orientation, gender identity and location.[2–5]Unvaccinated individuals pose a risk to public health, and seasonal flu causes severe illness and death in high-risk populations, costing the $10.4 billion in annual healthcare costs; the average hospitalized flu case in Canada costs $11,092.[6–9] Delays between identifying a need for care and receiving services can increase complications, costs andhospitalization. [4,10] Moreover, while 94% of the world's countries mandate paid sick leave, the U.S. and Korea are the only OECD countries that do not, and 40% of American employees have no sick leave.[11,12] Studies estimate that 20 million Americans and 37% of employees in the United Kingdom go to work sick because they lack sick leave or have only one-day sick leave, respectively, infecting colleagues as a result.[13,14] Employees may also go into work when sick if their sick leave does not offer sufficient wage replacement.[13]

Solutions : Basic essential healthcare services include medical, dental, vision, mental health, substance use, preventive screenings, disease management and biometric assessments.[4] Providing free on-site flu vaccines with education on good health habits can increase vaccination rates and reduce flu cases. [15] Providing timely access to health services can relieve both actual and perceived barriers to care.[4,16] Studies demonstrate that the overwhelming majority of employees seek one-on-one benefits consultation and flexible coverage options so they can opt into coverage that best meets their individual schedule and health needs.[17] Studies also show that implementing paid sick leave reduces contagion in the workplace, improves employee productivity and reduces employee turnover.[13,14,18–20] Overall, enhancing access to essential healthcare and paid sick leave can help improve the physical, social and mental health of individuals and communities.[2,4]

PART 1 PROMOTE HEALTH BENEFITS (MAX : 1 PT)

For All Spaces:

A health benefits policy meets the following requirements:

a. Is available to all eligible employees and their designated dependents (e.g., spouse, domestic partner, child) at no cost or subsidized that includes the following services:
    1. Medical care.
    2. Dental care.
    3. Vision care.
    4. Sexual and reproductive health services, including obstetrics and gynecology (OB-GYN) services and sexually transmitted infection (STI) testing and treatment.
    5. Medication/prescription coverage.
    6. Essential immunizations, as determined based on region.
    7. Preventive screenings and biometric assessments.
    8. Tobacco cessation programs.
    9. Infectious disease testing (e.g., tuberculosis, malaria, COVID-19) during a regional or global infectious disease outbreak, epidemic or pandemic as declared by a regional or global public health agency (e.g., WHO, disease control and prevention centers or equivalent).
b. Confidential benefits consultations are available with clearly identified and qualified support staff (e.g., benefits counselor, human resources representative).

PART 2 OFFER ON-DEMAND HEALTH SERVICES (MAX : 1 PT)

For All Spaces:

A health benefits policy is available for all eligible employees that provides health services at no cost or subsidized, on-site and in-person within 0.25 mi of the project boundary or through a telemedicine provider or digital health platform. The health services program meets the following requirements:

a. Experienced and qualified healthcare providers (e.g., physician, nurse practitioner, physician assistant) are available to provide confidential medical treatment for episodic, recurrent, urgent or other illnesses before, during and/or after regular business hours.
b. A scheduling system that allows drop-ins and/or appointment booking.
c. Eligible employees are permitted to use services during the workday if appointments are only available during regular business hours.

PART 3 OFFER SICK LEAVE (MAX : 1 PT)

For All Spaces:

A sick leave policy that meets the following requirements is available to all eligible employees:

a. Leave is offered upfront or accrued for use during any 12-month period for any health condition and meets one of the following requirements:
    1. Short-term sick leave for all eligible employees, distinct from paid time off and family leave, at least 10 days of which are paid at 50% or higher of the employee's full salary or wages.
    2. At least 20 days of combined paid time off and sick leave, which are paid at 50% or higher of the employee's

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

full salary or wages. Projects using a blended policy are not eligible to pursue Feature M06 Part 1.

b. Statement that discourages employees from coming into work when they feel sick and from doing work while on sick leave.

c. At least one of the following:

   1. At least 12 weeks of sick leave (which may be unpaid) during any 12-month period for a chronic or serious health condition that involves inpatient care in a hospice or residential healthcare facility (e.g., stroke, infectious disease, surgery) or a health condition that requires continuing treatment and/or supervision by a healthcare provider (e.g., diabetes, asthma, cancer).
   2. Part-time options, flexible schedules or permission to work from home when recovering from serious health conditions.

PART 4 SUPPORT COMMUNITY IMMUNITY (MAX : 1 PT)

For All Spaces:

The project identifies an immunization relevant to the target population and implements an immunization program which includes the following:

a. Makes the immunization available to regular occupants on at least an annual basis at no cost through either:

   1. An on-site clinic or program.[15]
   2. An off-site clinic or program (e.g., free community clinic, access through health care providers) and, for employees (as applicable), paid time during the workday to receive the immunization.[21]

b. For employees, as applicable, at least one day of paid leave for recovery or sick leave following immunization.

c. A campaign that addresses the following:[15]

   1. Provides regular occupants information on how the project facilitates immunization availability.
   2. Encourages or incentivizes, through monetary or non-monetary methods, regular occupants to receive the immunization.
   3. Educates regular occupants on the health reasons to receive the immunization.

PART 5 B PROVIDE ENHANCED HEALTH BENEFITS (MAX : 1 PT)

For All Spaces:

A health benefits policy is available for all eligible employees and their designated dependents (e.g., spouse, domestic partner, child) at no cost or subsidized. Health services must include at least four of the following:

a. Nutrition support and services (e.g., medical nutrition therapy including nutrition supplements and enteral nutrition).[22-24]

b. Complementary and integrative healthcare services (e.g., herbal therapy, mind and body practices such as acupuncture, massage, yoga, aquatic therapy).

c. Non-Emergency Medical Transportation (NEMT) that includes reimbursable transportation both to and from medical appointments, utilizing a form of transportation that meets the medical needs of the individual and covering all associated expenses.[25]

d. Elder care, including home health care.

e. Fertility Services (e.g., in vitro fertilization, iatrogenic infertility).

f. Doulas or other birth support workers.

g. Comprehensive Abortion Care (CAC).

h. Gender-affirming care including, at a minimum, hormone therapy and surgery.

Note :

This part is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. U.S. Department of Health and Human Services. Healthy People 2020: Social Determinants of Health. https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health. Accessed February 7, 2018.
2. Braveman P, Gottlieb L. The Social determinents of Health: It's Time to Consider the Causes of the Causes. 2014;129:19-31. doi:10.1177/00333549141291S206

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

3. Weissman J, Stern R, Fielding S, Epstein A. Delayed Access to Health Care: Risk Factors, Reasons, and Consequences. Ann Intern Med. 1991;114(4):325-331.
4. U.S. Department of Health and Human Services. Access to Health Services | Healthy People 2020. https://www.healthypeople.gov/2020/topics-objectives/topic/Access-to-Health-Services. Accessed February 4, 2018.
5. Gulliford M, Figueroa-Munoz J, Morgan M, et al. What does "access to health care" mean? J Heal Serv Res Policy. 2002;7(3):186-188. doi:10.1258/135581902760082517
6. World Health Organization. Influenza (Seasonal). http://www.who.int/mediacentre/factsheets/fs211/en/. Published 2018. Accessed February 4, 2018.
7. Duncan IG, Taitel MS, Zhang J, Kirkham HS. Planning influenza vaccination programs: a cost benefit model. Cost Eff Resour Alloc. 2012;10(1):10. doi:10.1186/1478-7547-10-10
8. McKibbin WJ, Sidorenko AA. The Global Costs of an Influenza Pandemic. Milken Inst Rev. 2007.
9. Centers for Disease Control and Prevention. Make It Your Business To Fight The Flu: A Toolkit for Employers. https://www.cdc.gov/flu/pdf/business/toolkit_seasonal_flu_for_businesses_and_employers.pdf.
10. Prentice JC, Pizer SD. Delayed access to health care and mortality. Health Serv Res. 2007;42(2):644-662. doi:10.1111/j.1475-6773.2006.00626.x
11. Raub A, Chung P, Batra P, et al. Paid Leave for Personal Illness: A Detailed Look at Approaches Across OECD Countries.; 2018.
12. U.S. Congress Joint Economic Committee. Expanding Access to Paid Sick Leave: The Impact of the Healthy Families Act on America's Workers.; 2010.
13. Scheil-Adlung X, Sandner L. The Case for Paid Sick Leave.; 2010. https://www.who.int/healthsystems/topics/financing/healthreport/SickleaveNo9FINAL.pdf. Accessed June 5, 2020.
14. Heymann J, Rho HJ, Schmitt J, Earle A. Contagion Nation: A Comparison of Paid Sick Day Policies in 22 Countries.; 2009. www.cepr.net. Accessed June 5, 2020.
15. Greenbaum E, Meinert E. Vaccinating Against the Flu: A Business Case. 2010;(September). https://www.sfcdcp.org/wp-content/uploads/2018/01/Vaccinating-against-Flu-A-business-case-id795.pdf.
16. Jacobs B, Ir P, Bigdeli M, Annear PL, Damme W Van. Addressing access barriers to health services: an analytical framework for selecting appropriate interventions in low-income Asian countries. Health Policy and Planning. https://www.who.int/alliance-hpsr/resources/alliancehpsr_jacobs_ir_barriershealth2011.pdf. Published 2011. Accessed October 28, 2019.
17. MetLife. Work Redefined: A New Age of Benefits. 2017. https://benefittrends.metlife.com/us-perspectives/work-redefined-a-new-age-of-benefits/.
18. Estimating the Distributional Impacts of Alternative Policies to Provide Paid Sick Days in the United States Issue Brief-Worker Leave Analysis and Simulation Series 1.; 2017. https://www.dol.gov/asp/evaluation. Accessed June 5, 2020.
19. Scheil-Adlung X, Sandner L. Evidence on paid sick leave: Observations in times of crisis. Intereconomics. 2010;45(5):313-321. doi:10.1007/s10272-010-0351-6
20. Heymann J, Earle A, Hayes J. The Work, Family, and Equity Index How Does the United States Measure Up? About the Project on Global Working Families. www.mcgill.ca/ihsp. Accessed June 10, 2020.
21. Centers for Disease Control and Prevention. Workplace Vaccination Program. https://www.cdc.gov/coronavirus/2019-ncov/vaccines/recommendations/essentialworker/workplace-vaccination-program.html#anchor_1615585108235. Published 2021. Accessed July 12, 2021.
22. Medical Nutrition - NORD (National Organization for Rare Disorders). Accessed May 2, 2022. https://rarediseases.org/policy-issues/medical-nutrition/
23. How nutritional status, diet and dietary supplements can affect autism. A review - PubMed. Accessed May 12, 2022. https://pubmed.ncbi.nlm.nih.gov/23789306/
24. Academy Urges HHS to Reduce Barriers to Nutrition Services. Accessed May 12, 2022. https://www.eatrightpro.org/news-center/on-the-pulse-of-public-policy/regulatory-comments/academy-urges-hhs-to-reduce-barriers-to-nutrition-services
25. What is Non-Emergency Medical Transportation, Patient Access? Accessed May 12, 2022.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

https://patientengagementhit.com/news/what-is-non-emergency-medical-transportation-patient-access

26. Centers for Disease Control and Prevention. Guidance for Businesses and Employers Responding to Coronavirus Disease 2019 (COVID-19).

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C07 ENHANCED HEALTH AND WELL-BEING PROMOTION | O (MAX : 2 PT)

Intent : Cultivate a culture that prioritizes and promotes the health and well-being of all individuals.

Summary : This WELL feature requires projects to cultivate a culture of health through communications, health promotion programs and executive-level leadership.

Issue : Workplaces have the potential to promote and encourage healthy behaviors; however, if employees are unaware of the health promotion opportunities available, they are unlikely to participate.[1,2] Moreover, studies of organizations with successful workplace wellness programs demonstrate that isolated incentives or programs, or even just health-promoting physical environments alone, will not be effective in promoting employee health or engaging employees in healthy behaviors unless they are part of an overarching culture of health integrated into everyday operations.[1]

Solutions : The Robert Wood Johnson Foundation defines a culture of health as "a society that gives all individuals an equal opportunity to live the healthiest lives possible, whatever their ethnic, geographic, racial, socioeconomic or physical circumstances happen to be."[3] Organizations can build a culture of health through customized health promotion programs that are integrated into operations and business strategy, promoted through consistent communications, championed by leadership at all levels and given dedicated resources.[4,5] Incorporating incentives can raise employee participation and motivate behavior change such as weight loss and smoking cessation.[6] Medical and absenteeism costs fall by about $3.27 and $2.73, respectively, for every dollar spent on workplace health programs.[6] Successful health promotion programs can improve job satisfaction, sense of well-being, self-esteem and health status, and reduce stress and health risks.[7,8] Organizational benefits include lower healthcare costs and absenteeism and improved productivity, recruitment, retention, culture and employee morale.[7,8]

PART 1 PROMOTE CULTURE OF HEALTH (MAX : 1 PT)

For All Spaces:

1: Health promotion strategies

Occupant health and well-being is promoted through the following:

a. Monthly digital communications to employees and/or regular occupants (as applicable) that address the following:
    1. Reinforce the project's culture of health.
    2. Market health promotion policies and programs.
    3. Highlight stories from regular occupants (as applicable) who exemplify the project's health culture.
    4. Offer education (e.g., tips and resources created by the project or a third party) on at least two topics within the ten WELL concepts.[9]
b. Quarterly education sessions (e.g., workshops, lectures, seminars) that offer instruction on topics within the ten WELL concepts, covering at least two different concepts per year.

2: Health promotion coordinators

One of the following is present:

a. Health promotion group that meets at least quarterly, is actively involved in planning and implementing health promotion programs and policies and seeks to cultivate a culture of health in the project.[9]
b. Paid mid- or senior-level employee that plans and implements health promotion programs. Health promotion must be part of their job description, requirements and/or performance expectations.[9]Projects that meet Part 2 Health Promotion Leader automatically fulfill this requirement.

PART 2 ESTABLISH HEALTH PROMOTION LEADER (MAX : 1 PT)

For All Spaces:

The following requirements are met:

a. Project has at least one dedicated executive-level employee whose primary responsibility is to plan and oversee strategies that promote the physical, mental and emotional health and well-being of all employees (e.g., Chief Wellness Officer). The individual must be employed at the executive (C-Suite) level or report directly to a member of the executive (C-Suite) team.
b. Executive-level employee's job description and performance expectations must include the following:
    1. Established metrics or KPIs for promoting organizational health and well-being that are linked to employee's performance evaluation.
    2. At minimum annual reports by the employee on the progress of health promotion strategies and employee engagement to the executive (C-suite) team, Board of Directors and/or equivalent high-level stakeholders.
c. Executive-level employee is supported by at minimum one employee who helps plan and implement health promotion programs and policies.

REFERENCES

1. Garrin JM. The Power of Workplace Wellness: A Theoretical Model for Social Change Agency. J Soc Chang. 2014;6(1):109-117. doi:10.5590/JOSC.2014.06.1.08
2. Centers for Disease Control and Prevention. Communications | Planning | Model | Workplace Health Promotion. https://www.cdc.gov/workplacehealthpromotion/planning/communications.html. Published 2015. Accessed February 4, 2018.
3. RWJF. FROM VISION TO ACTION: measures to mobilize a culture of health. 2015:90.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

4. Mellor N, Webster J. Enablers and challenges in implementing a comprehensive workplace health and well-being approach. Int J Work Heal Manag. 2013;6(2):129-142. doi:10.1108/IJWHM-08-2011-0018
5. Loeppke R. Biometric Health Screening for Employers: Consensus Statement of the Health Enhancement Research Organization, American College of Occupational and Environmental Medicine, and Care Continuum Alliance. J Occup Environ Med. 2013;55(10):1244-1251. doi:10.1097/JOM.0b013e3182a7e975
6. Baicker K, Cutler D, Song Z. Workplace Wellness Programs Can Generate Savings. Health Aff. 2010;29(2):304-311. doi:10.1377/hlthaff.2009.0626
7. Centers for Disease Control and Prevention. Workplace Health Model | Workplace Health Promotion. https://www.cdc.gov/workplacehealthpromotion/model/index.html. Accessed February 4, 2018.
8. World Health Organization. Workplace health promotion. http://www.who.int/occupational_health/topics/workplace/en/. Published 2010. Accessed February 4, 2018.
9. Centers for Disease Control and Prevention. The CDC Worksite Health ScoreCard: An Assessment Tool for Employers to Prevent Heart Disease, Stroke, and Related Health Conditions. 2014. https://www.cdc.gov/dhdsp/pubs/docs/hsc_manual.pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C08 NEW PARENT SUPPORT | O (MAX : 3 PT)

Intent : Provide support for new parents to properly care for themselves and their children.

Summary : This WELL feature requires paid parental leave for primary and non-primary caregivers and supportive resources for parents returning to work.

Issue : Maintaining an infant's health before birth and during its first months of life is crucial to its long-term health.[1] Though infant care is a universal need, and most countries guarantee a minimum paid maternity leave, many do not offer paid partner leave, and when they do, it is often significantly shorter in duration.[2] Additionally, shorter and unpaid maternity leave may create barriers to accessing necessary healthcare such as postpartum healthcare, which is critical to receive in the first six weeks after childbirth to support new mothers' health.[3]

Solutions : The International Labor Organization recommends a minimum of 18 weeks of parental leave, with research indicating that 40 weeks of paid leave results in the greatest overall reduction of risk for low infant birth weight and infant mortality and results in higher rates of on-time infant immunizations.[1,4,5] Longer paid parental leave and back-to-work coaching programs are associated with numerous health benefits, including higher rates of breastfeeding, reduced infant mortality and postpartum depression, decreased risk of low birthweight infants and higher paternal involvement, as well as higher long-term achievement for children, including reduced school drop-out rates and increased medical appointment attendance.[4,6–10] Moreover, research shows that parental leave of up to a year (52 weeks) can help improve job continuity for women even years after childbirth.[11,12] Research also demonstrates that fathers who take paid leave of at least two weeks are far more engaged in childcare nine months after birth.[13] Organizational support for new parents can also increase employee retention and company loyalty.[14]

PART 1 OFFER NEW PARENT LEAVE (MAX : 3 PT)

For All Spaces:

1: Parental leave

A parental leave policy that meets the following requirements is available for all eligible employees:

a. At least 40 weeks of parental leave is offered to the designated birthing parent and/or primary care giver.[4,15] Of this, at least a portion must be paid at 75% or higher of the employee's full salary or wages and include benefits, per the table below.[15]

b. Parental leave is offered to the non-primary caregiver, of which at least a portion is paid at 75% or higher of the employee's full salary or wages and including benefits, per the table below.[13,16]

c. Leave must be separate from other types of leave (e.g., sick leave, paid time off) and may be used consecutively or non-consecutively during any 12-month period during pregnancy or after birth or adoption.

Tier	Weeks of Paid Leave for the Birthing Parent and/or Primary Caregiver		Weeks of Paid Leave for Non-Primary Caregiver	Point Value
1	At least 12 weeks	AND	At least 2 weeks	1 point
2	At least 18 weeks[5,17]	AND	At least 3 weeks	2 points
3	At least 30 weeks[4,11]	AND	At least 4 weeks	3 points

2: Parental support policies

The project or organization offers a policy that provides at least two of the following services to help employees utilize and return from parental leave:[4,6–9]

a. At least one of the following upon returning from parental leave:
   1. Part-time options (e.g., ramp back programs).
   2. Work from home flexibility.
   3. Flexible schedules.

b. Communications (e.g., emails, modules, trainings) sent to expecting parents about the parental leave policies and resources, including guidance on the positive health impacts of parental leave.

c. Coaching or counseling program, or other resources to help employees transition when returning from parental leave.

d. Training for managers on how to work with employees to create a plan for parental leave and optimally support employees returning from parental leave.

REFERENCES

1. Heymann J, Sprague AR, Nandi A, et al. Paid parental leave and family wellbeing in the sustainable development era. Public Health Rev. 2017;38(1). doi:10.1186/s40985-017-0067-2
2. World Policy Analysis Center. Is paid leave available to mothers and fathers of infants? https://www.worldpolicycenter.org/policies/is-paid-leave-available-to-mothers-and-fathers-of-infants/is-paid-leave-available-for-mothers-of-infants. Accessed January 15, 2018.
3. Cheng C-Y, Fowles ER, Walker LO. Postpartum Maternal Health Care in the United States: A Critical Review. J Perinat Educ. 2006;15(3):34-42. doi:10.1624/105812406x119002
4. Burtle A, Bezruchka S. Population Health and Paid Parental Leave: What the United States Can Learn from Two Decades of Research. Healthcare. 2016;4(2):30. doi:10.3390/healthcare4020030

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

5. ILO. Recommendation R191 - Maternity Protection Recommendation, 2000 (No. 191).
6. Nepomnyaschy L, Waldfogel J. Paternity leave and fathers' involvement with their young children. Community, Work Fam. 2007;10(4):427-453. doi:10.1080/13668800701575077
7. Tanaka S, Waldfogel J. Effects of parental leave and work hours on fathers' involvement with their babies. Community, Work Fam. 2007;10(4):409-426. doi:10.1080/13668800701575069
8. Chatterji P, Markowitz S. Does the length of maternity leave affect maternal health? South Econ J. 2005;72(1):16. doi:10.1017/CBO9781107415324.004
9. Carneiro P, Løken K V., Salvanes KG. A Flying Start? Maternity Leave Benefits and Long-Run Outcomes of Children. J Polit Econ. 2015;123(2):365-412. doi:10.1086/679627
10. Tanaka S. Parental leave and child health across OECD countries. Econ J. 2005;115(501):F7-F28. doi:10.1111/j.0013-0133.2005.00970.x
11. Rossin-Slater M. Maternity and Family Leave Policy.; 2017. http://www.nber.org/papers/w23069.
12. Waldfogel J. International Policies toward Parental Leave and Child Care. Futur Child. 2001;11(1):98. doi:10.2307/1602812
13. U.S. Department of Labor. DOL Policy Brief: Paternity Leave: Why Parental Leave for Fathers Is so Important for Working Families.
14. Coulson M, Skouteris H, Dissanayake C. The role of planning, support, and maternal and infant factors in women's return to work after maternity leave. Fam Matters. 2012;90(1):33-44.
15. Galtry J, Callister P. Assessing the Optimal Length of Parental Leave for Child and Parental Well-Being How Can Research Inform Policy? 2005. doi:10.1177/0192513X04270344
16. Huerta MC, Adema W, Baxter J, et al. Fathers' Leave and Fathers' Involvement: Evidence from Four OECD Countries. Eur J Soc Secur. 2014;16(4):308-346. doi:10.1177/138826271401600403
17. Slavit W. Investing in Workplace Breastfeeding Programs and Policies: An Employers Toolkit. Washington, DC; 2009. https://www.businessgrouphealth.org/pub/?id=f2ffe4f0-2354-d714-5136-79a21e9327ed.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C09 NEW MOTHER SUPPORT | O (MAX : 3 PT)

Intent : Provide spaces and policies that encourage and support breastfeeding.

Summary : This WELL feature requires the provision of dedicated lactation rooms with supportive amenities, as well as paid break times, travel accommodations and resources to help mothers initiate and sustain breastfeeding.

Issue : New mothers represent a significant segment of the global labor force, and postpartum care is essential to the health of breastfeeding women and their babies.[1,2] Research shows that a lack of workplace accommodations contributes to shorter breastfeeding duration or leads to a drop in milk supply, resulting in early weaning.[2] Nursing parents need a safe, private space with essential amenities to continue breastfeeding or pumping after returning to work.[2,3] Breastfeeding can help reduce postpartum weight retention and also the risk of breast and ovarian cancer, and is recommended by the World Health Organization, United Nations Children's Fund and American Academy of Pediatrics to support optimal growth and development in infants.[4–8] The WHO recommends exclusive breastfeeding of infants up to six months of age, which reduces rates of asthma, allergies and ear infections among children and decreases rates of maternal depression.[9,10]

Solutions : Supportive breastfeeding programs, such as schedules that provide time for pumping or direct breastfeeding, lactation counseling and travel accommodations can help nursing mothers initiate and sustain breastfeeding.[2,11] Lactation rooms that promote a comfortable, calm and private space, optimize thermal and acoustic comfort and maximize accessibility needs can support the needs of each individual.[12] Breastfeeding programs can decrease healthcare expenses, reduce employee absences associated with caring for a sick child and increase female employee retention.[13]

PART 1 OFFER WORKPLACE BREASTFEEDING SUPPORT (MAX : 1 PT)

For All Spaces:

1: Breastfeeding support

The project or organization provides a policy to all eligible employees who are breastfeeding that meets the following requirements:

a. Paid break times for nursing or pumping that last at least 20 minutes at least every 3 hours, with flexibility as necessary to meet individual needs.[12]

b. One-time coverage or a subsidy of at least 50% for the purchase of a portable breast pump and/or availability of hospital-grade electric pump that accommodates multiple users.[13]

c. Postpartum lactation counseling, including back-to-work lactation counseling, offered at no cost or subsidized by at least 50%.[13]

2: Support while traveling

The project or organization provides a policy to all eligible employees who are breastfeeding while traveling for business that meets the following requirements:

a. For all trips: an insulated cooler is supplied at no cost or fully reimbursed.

b. For all overnight trips: hotels (or other overnight accommodations) with refrigerator access.

c. For trips lasting longer than 48 hours: full coverage or reimbursement for breastmilk shipping services (e.g., to have expressed milk shipped home).

PART 2 DESIGN LACTATION ROOM (MAX : 2 PT)

For All Spaces:

The project provides at least one dedicated lactation room for all employees that meets the following requirements:

a. Is at least 49 ft^2.12

b. Includes, at a minimum, the following:
   1. Work surface and comfortable chair.[12]
   2. Two electrical outlets.[12]
   3. User-operated lock with occupancy indicator (e.g., signage).[12]
   4. Reservation system, designed to consider privacy preferences (e.g., utilizes a numbering system instead of individual names).[12,13]
   5. Proximity to sink, faucet, paper towel dispenser and soap. These amenities are not required to be located in a lactation room but may not be located in a bathroom.[12]
   6. Refrigerator with dedicated, sufficient space for milk storage, based on assessment of user needs.[12]
   7. Dedicated microwave or other method to sanitize or sterilize pump equipment, through boiling, steaming, or other sterilizing solutions.[14]
   8. Dedicated storage space for pumping supplies.[12]

c. Provides a calming and comfortable environment that addresses, at a minimum, the following:
   1. Sound minimization.[12]
   2. Ambient lighting.[12]
   3. Thermal comfort.[12]

d. Present in a quantity that meets current and anticipated demand.[13]

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

REFERENCES

1. U.S. Department of Health and Human Services. Executive Summary: The Surgeon General's Call to Action to Support Breastfeeding. Off Surg Gen. 2011.
2. Shealy K, Li R, Benton-Davis S, Grummer-Strawn LM. Support for breastfeeding in the workplace. 2005. doi:10.1097/00006223-200003000-00003
3. Tsai S-Y. Impact of a Breastfeeding-Friendly Workplace on an Employed Mother's Intention to Continue Breastfeeding After Returning to Work. Breastfeed Med. 2013;8(2):210-216. doi:10.1089/bfm.2012.0119
4. Slusser W. Breastfeeding and Maternal and Infant Health Outcomes In Developed Countries. AAP Gd Rounds. 2007;18(2):15-16. doi:10.1542/gr.18-2-15
5. Baker JL, Gamborg M, Heitmann BL, Lissner L, Sørensen TIA, Rasmussen KM. Breastfeeding reduces postpartum weight retention. Am J Clin Nutr. 2008;88(6):1543-1551. doi:10.3945/ajcn.2008.26379
6. United Nations International Children's Emergency Fund. Breastfeeding. https://www.unicef.org/nutrition/index_24824.html. Published 2015.
7. American Academy of Pediatrics Subcommittee on Hyperbilirubinemia C, Greer F, Heinig M, Cohen R, Cook D. Breastfeeding and the Use of Human Milk. Pediatrics. 2012;120(6):1376-1376. doi:10.1542/peds.2007-2901
8. World Health Organization. Breastfeeding. http://www.who.int/nutrition/topics/exclusive_breastfeeding/en/. Accessed April 1, 2018.
9. Kramer MS, Kakuma R. Optimal duration of exclusive breastfeeding. Cochrane Database Syst Rev. 2002; (1):CD003517. doi:10.1002/14651858.CD003517
10. Burtle A, Bezruchka S. Population Health and Paid Parental Leave: What the United States Can Learn from Two Decades of Research. Healthcare. 2016;4(2):30. doi:10.3390/healthcare4020030
11. Mills SP. Workplace Lactation Programs. AAOHN J. 2009;57(6):227-231. doi:10.3928/08910162-20090518-02
12. York L, Lee J. AIA Best Practices: Lactation / Wellness Room Design. 2016. https://wellnessroomsite.files.wordpress.com/2016/08/17-0908-eng.pdf.
13. Office on Women's Health. (2021). Location for breaks. Reference Retrieved on Sept. 11, 2024.
14. Priming the Pump: Lactation Room Design Guidelines | Architect Magazine. Accessed May 4, 2022. https://www.architectmagazine.com/practice/priming-the-pump-lactation-room-design-guidelines_o

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C10 FAMILY SUPPORT | O (MAX : 3 PT)

Intent : Support working parents and caregivers so that they are able to properly care for members of their family.

Summary : This WELL feature requires projects to offer policies and programs that facilitate childcare and family leave.

Issue : Millions of working individuals take on the role of caregiver for their children, dependents and family members; with the rapidly growing population of older adults, the number of working caregivers will continue to rise.[1] Caregivers often have to adjust their work schedules or take time off, which can significantly impact productivity due to increased absenteeism, workday interruptions and unpaid leave.[2] An estimated 9% of caregivers left their jobs as a result of having to balance caregiving responsibilities with work obligations.[2,3] Employers that fail to meet the needs of caregiving employees can see reduced company productivity due to increased absenteeism, workday interruptions and unpaid leave, resulting in an annual average loss of 3.4 billion, 2.8 billion and 1.4 billion dollars, respectively.[2]Moreover, the loss of a loved one has been associated with higher risks of mortality, physical health problems leading to disability and hospitalization, and psychological stress like insomnia, depression and anxiety.[4,5] Grief is also tied to productivity loss: in the U.S., grief-inducing experiences cost employers an annual average of $75 billion in lost productivity and lost business.[6]

Solutions : By offering a range of accommodations, employers can create a supportive culture that meets the needs and caretaking responsibilities of all employees.[3] On-site childcare that supports flexible schedules can help working parents balance family needs and work demands. Flexible work arrangements can help retain and attract employees while also improving employee productivity and engagement.[3] Additionally, financial assistance, support groups and referral to community services can help individuals manage the unique challenges associated with being a caregiver.[7] Providing employees sufficient time away from work to grieve, in addition to grief counseling and other support, can help reduce employee anxiety, depression and other health risks over time.[4,8]

PART 1 OFFER CHILDCARE SUPPORT (MAX : 1 PT)

For All Spaces:

At least three of the following are provided for all employees:

a. On-site childcare centers compliant with local childcare licensure regulations, or subsidies of at least 50% for off-site or at-home childcare.[9]

b. Back-up childcare coverage (e.g., drop-in daycare, overnight childcare, in-home babysitting service, virtual childcare service) in case of unexpected events (e.g., family emergency, school closure) at no cost or subsidized by at least 50%.[10]

c. School break childcare programs (e.g., center- or home-based care during school break or winter holidays)[10] at no cost or subsidized by at least 50%.

d. Policy allowing the use of paid sick leave, family leave or personal days for the care of a child.

e. Policy allowing at least one of the following to support all employees with children:

   1. Part-time options.
   2. Work from home flexibility.
   3. Flexible schedules.[7]

PART 2 OFFER FAMILY LEAVE (MAX : 1 PT)

For All Spaces:

The project or organization makes a family leave policy available to all eligible employees that meets the following requirements:

a. At least 12 weeks of leave during any 12-month period, paid at 75% or higher of the employee's full salary or wages, for the care of a spouse, domestic partner, child, dependent, parent, parent-in-law, grandparent, grandchild, sibling or other designated relation with a chronic or long-term serious health condition (including an illness, injury, impairment or physical or mental health condition) that involves one of the following:[11]

   1. Inpatient care in a hospital, hospice or residential healthcare facility for conditions such as stroke, infectious disease or PTSD.
   2. Continuing treatment and/or supervision by a healthcare provider for conditions such as diabetes, asthma or cancer.

b. The option to use paid sick leave or personal days for the care of a spouse, domestic partner, child, dependent, parent, parent-in-law, grandparent, grandchild or sibling.

c. At least one of the following for the care of a spouse, domestic partner, child, dependent, parent, parent-in-law, grandparent, grandchild, sibling or other designated relation:

   1. Part-time options.
   2. Work from home flexibility.
   3. Flexible schedules.

PART 3 OFFER BEREAVEMENT SUPPORT (MAX : 1 PT)

For All Spaces:

A bereavement policy is available to all eligible employees that includes the following requirements:

a. Protocol for notifying supervisors of the loss.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

b. Bereavement leave that includes:

   1. At least five days of paid leave during any 12-month period for the loss of a child (including miscarriages and stillbirths), spouse, parent or dependent.[12,13]
   2. At least three days of leave, paid at 75% or higher of the employee's full salary or wages, during any 12-month period for the loss of a family member, colleague or friend.[12,13]
   3. Additional unpaid leave for any of the above losses during any 12-month period, granting employees a minimum of 20 days of leave to use at any point in the bereavement process. The days of paid leave may be counted toward the 20 days.

c. Bereavement support resources, covering:

   1. Coping with grief.
   2. Returning to work after a loss.[8,14]
   3. Accessing local bereavement support services.[8,14,15]

d. Coverage for bereavement counseling services at no cost or subsidized by at least 50%.

REFERENCES

1. World Health Organization. Facts about ageing. http://www.who.int/ageing/about/facts/en/. Published 2015. Accessed February 8, 2018.
2. U.S. Department of Labor. Employment Characteristics of Families - 2016. https://www.bls.gov/news.release/famee.toc.htm. Published 2017. Accessed April 1, 2018.
3. Pew Research Center. Americans Widely Support Paid Family and Medical Leave, but Differ Over Specific Policies. 2017. http://www.pewsocialtrends.org/2017/03/23/americans-widely-support-paid-family-and-medical-leave-but-differ-over-specific-policies/.
4. Stroebe M, Stroebe W, Schut H. Health consequences of bereavement: A review. Lancet. 2007;370(May 2016):1960-1973. https://www.researchgate.net/publication/46686960_Health_consequences_of_bereavement_A_review.
5. Buckley T, Sunari D, Marshall A, Bartrop R, McKinley S, Tofler G. Physiological correlates of bereavement and the impact of bereavement interventions. Dialogues Clin Neurosci. 2012;14(2):129-139. http://www.ncbi.nlm.nih.gov/pubmed/22754285. Accessed April 26, 2018.
6. James J, Friedman R, Cline E. Grief Index : The "Hidden" Annual Costs of Grief in America's Workplace : 2003 Report. Sherman Oaks; 2003. http://www.worldcat.org/title/grief-index-the-hidden-annual-costs-of-grief-in-americas-workplace-2003-report/oclc/166423828. Accessed April 26, 2018.
7. Higgins C, Lyons S. Reducing Work–Life Conflict: What Works? What Doesn't?; 2003. https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/occupational-health-safety/reducing-work-life-conflict-what-works-what-doesn.html.
8. The National Council for Palliative Care. Life After Death - Six steps to improve support in bereavement. 2014. http://www.dyingmatters.org/sites/default/files/Life After Death FINAL(1).pdf.
9. Slavit W. Investing in Workplace Breastfeeding Programs and Policies: An Employers Toolkit. Washington, DC; 2009. https://www.businessgrouphealth.org/pub/?id=f2ffe4f0-2354-d714-5136-79a21e9327ed.
10. Canadian Centre for Occupational Health and Safety. Work/Life Balance. http://www.ccohs.ca/oshanswers/psychosocial/worklife_balance.html. Accessed December 15, 2017.
11. State of New York. Paid Family Leave for Family Care.
12. Society for Human Resource Management. Customized Paid Leave Benchmarking Report. 2017:43. https://www.shrm.org/ResourcesAndTools/business-solutions/Documents/Paid-Leave-Report-All-Industries-All-FTEs.pdf.
13. Society for Human Resource Management. Examining Paid Leave in the Workplace. 2008:32. https://www.shrm.org/hr-today/trends-and-forecasting/research-and-surveys/pages/2016-paid-leave-in-the-workplace.aspx. Accessed April 26, 2018.
14. National Hospice and Palliative Care Organization. When an Employee Suffers a Loss. https://www.med.umich.edu/socialwork/oda/docs/WhenEmployeeSuffersLoss.pdf. Published 2007. Accessed April 26, 2018.
15. Aoun SM, Rumbold B, Howting D, Bolleter A, Breen LJ. Bereavement support for family caregivers: The gap

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

between guidelines and practice in palliative care. van Wouwe JP, ed. PLoS One. 2017;12(10):e0184750. doi:10.1371/journal.pone.0184750

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C11 CIVIC ENGAGEMENT | O (MAX : 2 PT)

Intent : Encourage individuals to become actively involved in and connected to the surrounding community through volunteerism, public spaces and community programming.

Summary : This WELL feature requires a commitment to civic engagement through charitable activities, designated public spaces and community engagement programs.

Issue : Millennials represent an increasingly large segment of the workforce, yet surveys find that one in four millennials plan to quit their current employer in the next year due to the perception that their company's goals do not extend beyond profit.[1] Companies that do not demonstrate stronger social values through civic engagement opportunities, like community volunteering, have been shown to experience lower employee morale, engagement and productivity.[2] Moreover, research in the U.S. reveals a decline in community social support and relations, with people who feel disconnected from their community encountering more mental health issues than those with a strong community connection.[3–5]

Solutions : It is essential for companies to consider the link between corporate social reputation and talent attraction. [6] Scheduling volunteer opportunities, providing paid volunteer time off, matching employee charitable contributions and working with local community organizations can foster a culture of social responsibility, enhance employee retention and make a positive contribution to the local community.[1,2,7,8] There are a variety of ways to increase opportunities for civic engagement and establish a culture of social responsibility. Moreover, projects that provide public use spaces and community programming can encourage social interaction and cohesion, community empowerment and collective feelings of ownership, reducing community health risks like stress, depression, heart disease, stroke and chronic disease and improving physical and mental health, happiness and healthy behaviors.[3,5,9–12]

PART 1 PROMOTE COMMUNITY ENGAGEMENT (MAX : 1 PT)

For All Spaces:

The project or organization has a policy that meets at least two of the following requirements:

a. All eligible employees are given the option to take paid time off to participate in volunteer activities for at least the equivalent of two workdays annually (separate from vacation, sick or other generally allocated paid time off).

b. A list of local volunteer opportunities is provided to all employees, with at least one suitable opportunity per month and at least eight hours organized by the employer with a registered charity or non-profit per year.

c. Employer matches employee's contributions to a registered charity or non-profit of employee's choice, up to a maximum annual amount defined by the employer.

d. At least one community engagement program (e.g. events, talks, workshops, trainings or other public engagement intended to promote education, play, physical activity, social connection and/or well-being) at no cost to the public on a quarterly basis on- or off-site.[3,13,14]

PART 2 PROVIDE COMMUNITY SPACE (MAX : 1 PT)

For All Spaces:

Option 1: Public space

The project designates outdoor or indoor space for public use at no cost that meets the following requirements:

a. At least 2,000 ft^2.[15]

b. Open at all times, unless closed for security purposes (e.g., during nighttime hours) or temporarily for special events.[15]

c. Signage or other communication clearly indicates hours the space is open and the designation for public use.[15]

d. Provides quality seating areas and is easily navigable for individuals of all abilities.[15,16]

OR

Option 2: Community event space

One or more indoor or outdoor spaces within the project boundary are open for public convenings (e.g., local community groups, student clubs, non-profit organizations) at no cost that meets the following requirements:

a. Has the capacity to hold to least 10 people.

b. Is available for meetings and/or events (e.g., pop-up health services, community meetings) on a weekly basis, at a minimum.[3,13,14]

REFERENCES

1. Deloitte. The 2016 Deloitte Millennial Survey: Winning over the next generation of leaders. 2016. http://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/gx-millenial-survey-2016-exec-summary.pdf.
2. Turner YS. The Civic 50: Best Practices in Corporate Community Engagement. 2015:1-8. https://www.conference-board.org/retrievefile.cfm?filename=TCB-GT-V1N9-Best_Practices_CorpCommunityEngmnt1.pdf&type=subsite.
3. Heroux J, Norris T, Rube K, Nadimi V. The Case for Healthy Places. 2016. https://daks2k3a4ib2z.cloudfront.net/5810e16fbe876cec6bcbd86e/5a626855e27c0000017efc24_Healthy-Places-PPS.pdf.
4. U.S. Department of Health and Human Services. Healthy People 2020: Social Determinants of Health. https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health. Accessed February 7, 2018.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

5. Francis J, Giles-Corti B, Wood L, Knuiman M. Creating sense of community: The role of public space. J Environ Psychol. 2012;32:401-409.
6. Deloitte. The 2016 Deloitte Millennial Survey, Germany - Country Report. 2016;(January).
7. Levine P, Kawashima-Ginsber K. Civic Health and the Economy: Making the Connection. 2013. https://www.ca-ilg.org/sites/main/files/file-attachments/civic_health_and_the_economy.pdf.
8. Hayes K. A Narrative Study of Service Learning and Workplace Volunteering: Increasing Participation and Improving Outcomes for Employee Volunteers. 2016.
9. Clark CJ, Guo H, Lunos S, et al. Neighborhood cohesion is associated with reduced risk of stroke mortality. Stroke. 2011;42(5):1212-1217. doi:10.1161/STROKEAHA.110.609164
10. Kim ES, Park N, Peterson C. Perceived neighborhood social cohesion and stroke. Soc Sci Med. 2013;97:49-55. doi:10.1016/j.socscimed.2013.08.001
11. Chuang YC, Chuang KY, Yang TH. Social cohesion matters in health. Int J Equity Health. 2013;12(1):87. doi:10.1186/1475-9276-12-87
12. Flacke J, Schüle SA, Köckler H, Bolte G. Mapping environmental inequalities relevant for health for informing urban planning interventions—a case study in the city of Dortmund, Germany. Int J Environ Res Public Health. 2016;13(7). doi:10.3390/ijerph13070711
13. Gehl Institute and Gehl. Public Life & Urban Justice in NYC's Plazas. 2015:119.
14. NYC Department of Planning. Zoning Districts and Tools: Privately Owned Public Spaces. https://www1.nyc.gov/site/planning/zoning/districts-tools/private-owned-public-spaces.page. Accessed April 26, 2018.
15. NYC Planning - Privately Owned Public Space. https://www1.nyc.gov/site/planning/plans/pops/pops-plaza-standards.page. Published 2009. Accessed April 26, 2018.
16. Levine D. The NYC Guidebook to Accessibility and Universal Design. 2003. https://www1.nyc.gov/assets/ddc/downloads/publications/guides-manuals/universal-design-ny.pdf.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C12 TALENT RECRUITMENT AND WORKFORCE ACTION PLANS | O (MAX : 3 PT)

Intent : Promote employee engagement and belonging through an assessment of workforce demographics, creation of an action plan to improve engagement and belonging outcomes, implementation of support systems for employees, and implementation of fair hiring and pay practices.

Summary : This WELL feature requires projects to evaluate their current workforce demographics and develop an action plan to address employee engagement and belonging; implement support systems for employees including non-discrimination policies and training, employee resource groups, and dedicated leadership support; and implement fair and transparent hiring and pay practices.

Issue : Research estimates that the vast majority (64%-85%) of companies identify employee engagement and belonging as a strategic priority. [90, 654] Yet, only 4% of companies surveyed feel they are implementing successful policies and programs.[90] Further, less than 30% of those companies have leaders who are accountable to results. [654] One contributor to inequality in the workplace is from a perceived lack of safety and fear of repercussion when reporting discrimination or abuse at work.[91] It is estimated that only 30% of employees in the United States who are harassed on the basis of protected classes (e.g., gender, race, disability) file internal complaints.[92] Other barriers to reporting include lack of anonymity, company culture, inaccessible and inflexible reporting processes, and the unlikelihood of a positive outcome.91 For example between 2013 and 2016, just 15% of charges filed by LGBTQ+ individuals in the U.S. resulted in a positive outcome for the reporting party.[93]

Solutions : Workforce representation accounts for multiple demographic factors including gender, age, race, ethnicity, socioeconomic status, disability, and more. [6] Addressing workforce representation is complex and touches upon all of an organization's operations, including hiring practices, determination of compensation and wages, workplace culture and organizational structure. Organizations that seek to hire individuals with different backgrounds and experiences and that espouse fair treatment toward all individuals in their workforce through measurable actions drive both profit and positive culture by attracting and retaining top talent and driving innovation.[2]

PART 1 CREATE WORKFORCE ASSESSMENT, ENGAGEMENT AND BELONGING PLAN (MAX : 1 PT)

For All Spaces:

The project or organization meets the following requirements:

a. An assessment of the project or organization's current workforce demographics is conducted utilizing at least four of the following:
    1. Gender (assigned, identity and/or expression).
    2. Sexual orientation.
    3. Race and ethnicity.
    4. Age.
    5. Socioeconomic background.
    6. Disability.
    7. Other metric(s) as identified by the project or organization.
b. A workforce engagement and belonging plan is established and meets the following requirements:
    1. Identifies strategies to help all employees feel accepted, valued and included, considering findings from the demographic assessment.
    2. Tracks progress toward implementing those strategies on an annual basis.
    3. Publicly summarizes annual progress (e.g., on company website, in annual report).

PART 2 IMPLEMENT WORKFORCE SUPPORT SYSTEMS (MAX : 1 PT)

For All Spaces:

The project or organization meets the following requirements:

a. Implements a comprehensive non-discrimination policy that includes the following:
    1. Reporting protocol that allows occupants to anonymously report observed or experienced discrimination, resulting in a review by a third party and/or internal human resource professional or other ethics or compliance professional with the offending individual to mitigate future incidents.
    2. Penalties for retaliating against or falsifying reports of bias.
b. Annual trainings available to all employees that include the following topics:
    1. The benefits having a workforce comprised of people with different backgrounds.
    2. Preventing, identifying and navigating observed or experienced discrimination.
    3. Preventing, identifying and reducing bias.
c. Provides employees with resources (e.g., budget, meeting space, information, access to external support groups) to establish employee resource groups (ERGs) that are focused on fostering engagement and belonging within the workforce.
d. Has at least one dedicated senior-level employee whose primary responsibility is to plan and oversee strategies that promote workforce engagement and belonging. The individual must have a dedicated budget and be employed at the executive (C-Suite) level or report directly to a member of the executive (C-Suite) team.[1]

PART 3 IMPLEMENT FAIR HIRING AND PAY PRACTICES (MAX : 1 PT)

For All Spaces:

The project or organization meets the following requirements:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

a. Implements a hiring policy that:
    1. Bans the request of salary history.
    2. Requires blind resume reviews (i.e., information is removed that could indicate race/ethnicity, gender and socioeconomic background, including, at minimum, name and home address).
    3. Establishes hiring evaluation protocols with transparent performance standards (e.g., communicating job requirements clearly and establishing fair and consistent performance objectives for all employees, demonstrating transparency and clear expectations for every role).
    4. Establishes goals for hiring candidates with varied backgrounds, perspectives and experiences, which hiring managers are evaluated at performance reviews at least annually.
    5. Establishes having varied backgrounds, perspectives and experiences represented in mid-and executive-level leadership positions and/or on the board of directors.
b. Implements a compensation policy that is made available to all employees and includes at least three of the following:
    1. Determination of compensation independent of gender identity, sexual orientation, race and ethnicity, age, disability status, or religion.
    2. Provision of compensation that meets basic needs and provides some discretionary income to all employees.
    3. Compensation transparency (e.g., making employee compensation figures visible either internally, externally or both) or published compensation ranges for all titles.[7-9]
    4. A blind annual evaluation of all employee compensation to assess and improve fair compensation distribution.
    5. Annual trainings or workshops for employees on compensation and contract negotiation.

REFERENCES

1. Hunt D, Prince S, Dixon-Fyle S, Dolan K. Diversity Wins: How inclusion matters. 2020. Reference
2. The B Team. Diversity: Bringing the Business Case to life. 2015. Reference.
3. Office for National Statistics. Gender Pay Gap in the UK: 2024. Accessed April 14, 2025. Reference
4. Bachmann CL, Gooch B. LGBT in Britain - Work Report.; 2018. Accessed April 14 2025. Reference
5. Disability and Employment Fact Sheet 1. Accessed April 14 2025. Reference
6. The B Team. The Diversity Paradox: Capturing the Value of Difference by Looking Beyond the Numbers. The B Team; 2015. Reference
7. Korn Ferry. How to Achieve Pay Equity and Transform Your Workplace. 2024. Accessed April 14 2025. Reference
8. Mayer, K. One Benefit of Pay Transparency? More Productive Workers. 2023. Accessed April 14 2025. Reference
9. Comport. The Link Between Compensation and Diversity Strategies for Creating Inclusive Pay Practices. 2023. Accessed April 14 2025. Reference

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C13 ACCESSIBILITY AND UNIVERSAL DESIGN | O (MAX : 4 PT)

Intent : Make spaces more accessible, comfortable and usable for people of all backgrounds and abilities.

Summary : This WELL feature requires projects integrate universal design and wayfinding principles to accommodate a variety of needs and create a more supportive environment for all.

Issue : More than one billion people, or about 16% of the global population, live with some type of disability, a health condition and/or impairment a person experiences. [20] Although buildings serve people with varying needs and abilities, many are not designed to accommodate individual requirements.[5,7] Wayfinding, or knowing how to follow a navigational route, is fundamental for autonomy, social integration and community access for all individuals.[4] People who are neurodiverse often lack internal spatial representation and awareness, so they find wayfinding to be particularly challenging and mentally straining.[4] The "fear of getting lost" is the most frequent wayfinding challenge for people with cognitive differences.[5] As a result, individuals tend to stick to routine or well-known trips to avoid the significant stress associated with navigating new spaces.

Solutions : Universal design addresses multiple aspects of a space, including infrastructure, signage and technologies, and seeks to enhance the opportunity for all individuals to exist independently and comfortably in that space.[11] Supportive spaces and places should be designed to effectively accommodate a range of individual needs.[11] There are several solutions that can enhance universal design for all people and address wayfinding challenges. Easily identifiable landmarks, such as sculptures, artwork and distinct architectural elements, can serve as significant points of reference during the navigational process as they are often memorable.[32] Additionally, printed and digital signage provides important information for navigation as well as at points for decision-making.[2] Simple and user-friendly sitemaps that are strategically positioned at key locations throughout a building, including entrances, can quickly help individuals orient and move throughout a space.[11] Moreover, electronic maps can allow individuals to preview routes before engaging in travel.[7, 22] This format is especially helpful for people who are neurodivergent as it provides individuals with greater control and the ability to choose how they navigate the environment.[22] Lastly, providing wayfinding information in various formats that support a range of cultures and abilities (e.g., braille, different languages) enhances access, allowing all individuals to more easily navigate spaces.[11]

PART 1 INTEGRATE UNIVERSAL DESIGN (MAX : 2 PT)

For All Spaces:

The project considers best practices in universal design to accommodate a range of disabilities and needs by implementing at a minimum one strategy in each of the following categories:[9]

a. Physical access: entry, exit and key interaction points that enable accessible entrance to the project and strategies that accommodate user changes as needed (e.g., stair-free entrances, step-free egress, operable windows, automatic doors), supporting ease and independence of use.[1,7,10]

b. Developmental and intellectual health, including sensory requirements of people who are neurodiverse: strategies that use color, texture, images and other multi-sensory, visually perceptible information.[1,10,11]

c. Wayfinding: strategies that help individuals intuitively navigate through the project (e.g., signage, tactile maps, symbols, auditory cues, information systems, images, color that considers color blindness, various languages).[10]

d. Policies and programs: strategies that support belonging and accommodate a range of needs (e.g., bias and discrimination training, flexible work hours for individuals with disabilities).[1,7,10]

e. Technology: technology (e.g., audio and visual equipment, web access, QR codes) that helps individuals fully utilize a space (e.g., remote access to assist blind or deaf individuals, support for those who do not speak the native language), made available to all occupants at no cost.[1,7,10]

f. Safety: strategies that support easy access to all spaces and amenities and minimize risk of injury, confusion or discomfort (e.g., lighting or clear sightlines to increase feelings of security, service animals, emergency egress plans with highlighted exit points).[1,10,11]

PART 2 B SUPPORT INTERIOR NAVIGATION (MAX : 1 PT)

For All Spaces:

Primary circulation routes meet the following requirements:

a. Include landmarks (e.g., sculptures, water features, artwork, architectural elements) that are:
   1. Positioned at points-of-decision (e.g., intersections, elevators, stairways and emergency exits).[21, 22]
   2. Physically prominent and unique (e.g., due to shape, color, size, historical or cultural significance).[21]

b. Include amenities (e.g., restrooms, quiet areas, drinking water stations, information services) that are:
   1. Within a clear line of sight to another landmark or amenity.
   2. Located consistently throughout the project boundary (e.g., same location on each floor).[21]

c. Include seating areas that are located consistently throughout the project boundary (e.g., same location on each floor).[21]

Note :

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 3 B SUPPORT INCLUSIVE BUILDING & NEIGHBORHOOD WAYFINDING (MAX : 1 PT)

For All Spaces:

Information is provided for the building in a way that meets the following requirements:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

a. Is present in a physical format (e.g., printed signage, digital display) at the main building entrance and at least one additional functional building entrance, if present.

b. Is available in an electronic format (e.g., website, mobile application).

c. All formats meet the following:

   1. Include audio and/or braille that is compliant with ICC/ANSI A117.1-2003.
   2. Use clear and simple language.[9]
   3. Include more than one language.[9]
   4. Include contact information for assistance services (e.g., screen readers, listening systems, wayfinding apps).

d. All formats include a local amenities directory that meets the following:

   1. Displays the location of at least 8 existing use types (as defined in Appendix V1) relative to the building.
   2. Displays the location of all public transit stops located within a 400 m [0.25 mi] walk distance of the main building entrance, if present.

e. If multiple businesses are present, all formats include a business directory that shows the names of businesses located within the building and their locations (e.g., floor level, room number).

f. All formats include a site map of the building that shows the following, if present, using easily recognizable symbols:

   1. Bathrooms.
   2. Drinking water stations.
   3. Information services.
   4. Areas for resting or sitting.
   5. Wayfinding landmarks.[21]
   6. Accessible pathways.[22]
   7. Emergency exits.

g. All formats include a sensory map of the building that shows the following, if present, using easily recognizable symbols:[9,22]

   1. Restorative spaces.
   2. Loud sounds.
   3. Crowded spaces.
   4. Flashing lights.
   5. Strong smells.

Note :

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. Boslaugh SE, Andresen EM. Correlates of physical activity for adults with disability. Prev Chronic Dis. 2006;3(3) Reference. Accessed April 18, 2018.
2. Carpman JR, Grant MA. Wayfinding: A Broad View. In: Bechtel RB, Churchman A, eds. Handbook of Environmental Psychology. John Wiley & Sons Inc.; 2002: 427–442.
3. Centre for Excellence in Universal Design. What is Universal Design.Reference. Accessed February 12, 2018.
4. Delgrange R, Burkhardt JM, Gyselinck V. Difficulties and Problem-Solving Strategies in Wayfinding Among Adults With Cognitive Disabilities: A Look at the Bigger Picture. Front Hum Neurosci. 2020 Feb 18;14:46. doi: 10.3389/fnhum.2020.00046. PMID: 32132912; PMCID: PMC7039925.
5. Doyle N. Neurodiversity at work: a biopsychosocial model and the impact on working adults. Br Med Bull. 2020 Oct 14;135(1):108-125. doi: 10.1093/bmb/ldaa021. PMID: 32996572; PMCID: PMC7732033.
6. Food and Agriculture Organization of the United Nations. The State of Food Security and Nutrition in the World 2023. Downloaded from:Reference. (Accessed November 14, 2023).

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

7. Parker, A. T., Swobodzinski, M., Wright, J. D., Hansen, K., Morton, B., & Schaller, E. (2021). Wayfinding tools for people with visual impairments in real-world settings: A literature review of recent studies. Frontiers in Education, 6, Article 723816. https://doi.org/10.3389/feduc.2021.723816
8. Heylighen A. About the nature of design in universal design. Disabil Rehabil. 2014;36(16):1360-1368. doi:10.3109/09638288.2014.932850.
9. Hewitt, Jean. "Neurodiversity & the Built Environment - PAS 6463:2022." BSI, 2022. Downloaded from:Reference. Accessed July 7, 2024.
10. Hölscher C, Mellinger T, Vrachliotis G, Brösamle M, Knauff M. Up the Down Staircase: Wayfinding Strategies in Multi-level Buildings. Journal of Environmental Psychology. 2006;26(4):284-299.
11. International Health Facilities Guideline: An encyclopedia of knowledge for the Briefing, Planning and Design of Healthcare facilities, Version 4.2 Downloaded from:Reference.
12. Lanteigne V. WELL v1 Innovation Proposal - Universal Design. 2017.
13. Levine D. The NYC Guidebook to Accessibility and Universal Design. 2003.Reference.
14. Mind.org. Mental Health Facts and Statistics.Reference. Published 2017. Accessed July 2, 2020.
15. Persson H, Åhman H, Yngling AA, Gulliksen J. Universal design, inclusive design, accessible design, design for all: different concepts—one goal? On the concept of accessibility—historical, methodological and philosophical aspects. Univers Access Inf Soc. 2015;14(4):505-526. doi:10.1007/s10209-014-0358-z.
16. United Nations International Children's Emergency Fund. Adolescent demographics.ReferenceReference

Published 2019. Accessed July 2, 2020.
17. U.S. Department of Health and Human Science Services: Office of Disease Prevention and Health Promotion. Disability and Health: Overview. Healthy People 2020.ReferenceReference.Accessed April 18, 2018.
18. World Health Organization. Ageing and health.Reference. Published 2018. Accessed July 2, 2020.
19. World Health Organization. Mental disorders.Reference.
20. World Health Organization. (2022). Global report on health equity for persons with disabilities. World Health Organization. Retrieved from: https://www.who.int/publications/i/item/9789240063600
21. Yesiltepe D, Conroy Dalton R, Ozbil Torun A. Landmarks in wayfinding: a review of the existing literature. Cogn Process. 2021 Aug;22(3):369-410. doi: 10.1007/s10339-021-01012-x. Epub 2021 Mar 8. PMID: 33682034; PMCID: PMC8324579.
22. Cieslik, Emma. "Accessibility and Exhibit Safety: The Importance of Sensory Maps." Collections (2024): 15501906241232310.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C14 EMERGENCY RESOURCES | O (MAX : 2 PT)

Intent : Provide resources, personnel and training to help organizations, families and individuals respond to a variety of emergency situations.

Summary : This WELL feature requires projects to offer resources like first aid kits, automated external defibrillators (AEDs) and opioid response kits, coordinate with emergency response teams and provide emergency preparedness and response training.

Issue : It is estimated that sudden cardiac arrest (SCA) causes between 6.8 – 8.5 million deaths worldwide per year, with a global survival rate of less than 1%; in the United States, about 10,000 SCA deaths per year occur in the workplace.[1,2] An SCA victim's chances of survival lower by 7-10% with every minute that passes without cardiopulmonary resuscitation (CPR) or defibrillation.[3] Additionally, nearly 16,000 people worldwide die from preventable injuries each day, yet in most European countries, only 5-10% of the population is trained in first aid.[4,5] While natural disasters kill an average of 90,000 people annually, nearly 60% of American adults have not practiced what to do in a disaster.[6,7]Moreover, anaphylaxis causes up to 1,500 deaths per year in the U.S., with studies showing a delay in administering epinephrine to be a significant risk factor associated with fatal outcomes from allergen exposure.[8–10] Finally, drug overdose is the leading cause of accidental death in the U.S., with overdose from opioids driving the epidemic.[11]

Solutions : Rapid and effective emergency response requires coordination with local emergency responders and maintenance of emergency resources such as an emergency notification system, first aid kits and AEDs.[12,13] Supplementing those resources with occupant training on CPR, first aid, AED use and individual and family preparedness can increase individual response time and help improve survival rates; CPR and AED training alone can increase victim survival rates by nearly 40%.[3,12] In food allergy emergencies, quick access to and immediate availability of epinephrine is essential.[10,14] Finally, increasing the availability of naloxone is a critical component of reducing opioid-related overdose deaths, with evidence suggesting that when naloxone and overdose education are available to community members, overdose deaths decrease in those communities.[15]

PART 1 PROMOTE EMERGENCY RESOURCES (MAX : 1 PT)

For All Spaces:

1: Emergency resources

Resources are in place that support emergency response, including at least three of the following:

a. Information indicating emergency procedures (e.g., evacuation during fire or earthquake, containment and response strategies for infectious disease outbreaks, shelter-in-place during active shooter) available to all guests upon entrance to the building.

b. Building emergency notification system with auditory and visual indicators of emergency (e.g., public address systems, flashing lights).

c. At least one first aid kit per floor meeting requirements of Appendix C3.

d. AEDs accessible to any occupant within 328 feet and adoption of routine maintenance and testing schedule.[16,17,18] The locations of building AEDs are identified through posters, signs or other forms of communication other than on the AED itself.[17]

e. Undesignated epinephrine auto-injectors for food allergy emergencies.[14]

f. Rides for employees subsidized or reimbursed by at least 50% to destination of need for emergency situations (e.g., urgent medical needs, personal or family emergency), including from home to work as needed (e.g., during public transit shutdown).

2: Emergency training and personnel

At least two of the following are in place:

a. Emergency response team for medical emergencies, including at least one certified medical professional, first responder or other qualified personnel who has received emergency medical training (e.g., Emergency Medical Technician, paramedic, police, fire service, individuals certified in advanced first aid) present within the building during regular business hours.[17,18]

b. Security or crisis response team for human-caused disruptions (e.g., active shooter, civil unrest).

c. Annual availability to regular occupants of a certified training course on CPR, first aid and AED usage.[17]

d. Trainings to promote emergency preparedness available to regular occupants that address at least the following topics:

   1. Creating evacuation or sheltering plans.
   2. Building emergency kits, supplies and go-bags.
   3. For residents, if applicable, planning communications with family or primary contacts in case of emergency.

PART 2 PROVIDE OPIOID RESPONSE KIT AND TRAINING (MAX : 1 PT)

For All Spaces:

1: Opioid response kits

The following requirements are met:

a. All emergency preparedness or first aid kits include:

   1. Naloxone rescue kits. Projects may choose a single dose nasal spray, a multi-step nasal spray, a single step injection or a multi-step injection.
   2. Instructions for how to prepare and administer naloxone, as well as immediate next steps after administration.
   3. A list of who on-site has received opioid response training, and their contact information.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

b. Protocol is in place for follow-up after an opioid emergency event, including a plan for:
    1. Debriefing those affected.
    2. Immediate replacement of naloxone kit following use.
    3. Replacing expired kits.

2: Opioid response training

The following requirement is met:

a. Regular occupants receive opioid emergency training in-person or virtually, covering:
    1. General information about opioid use and naloxone.
    2. Recognizing the signs of an overdose and immediate steps to take.
    3. How to safely administer naloxone and steps to take following administration.

REFERENCES

1. Mehra R. Global public health problem of sudden cardiac death. J Electrocardiol. 2007;40(6 SUPPL. 1). doi:10.1016/j.jelectrocard.2007.06.023
2. Saving Sudden Cardiac Arrest Victims in the Workplace. https://www.osha.gov/Publications/3185.html. Accessed June 16, 2020.
3. Konig M. Every Second Counts - AED Fact Sheet 2013 - Final.; 2013. www.heart.org/policyfactsheets. Accessed June 16, 2020.
4. Krug EG, Sharma GK, Lozano R. The Global Burden of Injuries. Am J Public Health. 2000;90(4). https://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.90.4.523. Accessed June 16, 2020.
5. First Aid for a Safer Future - Focus on Europe.; 2009.
6. World Health Organization. Environmental health in emergencies: natural events. http://www.who.int/environmental_health_emergencies/natural_events/en/. Accessed August 12, 2017.
7. Sixty Percent of Americans Not Practicing for Disaster: FEMA urges everyone to prepare by participating in National PrepareAthon! Day on April 30 | FEMA.gov. https://www.fema.gov/news-release/2015/04/28/sixty-percent-americans-not-practicing-disaster-fema-urges-everyone-prepare. Accessed June 16, 2020.
8. Hsieh F. Anaphylaxis. Cleveland Clinic Center for Continuing Education - Disease Management. http://www.clevelandclinicmeded.com/medicalpubs/diseasemanagement/allergy/anaphylaxis/. Published December 2013. Accessed June 16, 2020.
9. Turner PJ, Jerschow E, Umasunthar T, Lin R, Campbell DE, Boyle RJ. Fatal Anaphylaxis: Mortality Rate and Risk Factors. J Allergy Clin Immunol Pract. 2017;5(5):1169-1178. doi:10.1016/j.jaip.2017.06.031
10. Boyce JA, Assa'ad A, Burks AW, et al. Guidelines for the diagnosis and management of food allergy in the United States: Report of the NIAID-sponsored expert panel. J Allergy Clin Immunol. 2010;126(6 SUPPL.):S1. doi:10.1016/j.jaci.2010.10.007
11. Opioid Addiction 2016 Facts & Figures. doi:10.15585/mmwr.mm655051e1
12. Berryman P, Lukes E, Mancini ME, Cazzell M, Kardong-Edgren S, Cason CL. Improving Workplace Safety Training Using a Self-Directed CPR-AED Learning Program. AAOHN J. 2009;57(4):159-167. doi:10.3928/08910162-20090401-02
13. Occupational Health and Safety Administration. How to Plan for Workplace Emergencies and Evacuations. 2001.
14. Access to Epinephrine | Food Allergy Research & Education.
15. U.S. Surgeon General's Advisory on Naloxone and Opioid Overdose | HHS.gov. https://www.hhs.gov/surgeongeneral/priorities/opioids-and-addiction/naloxone-advisory/index.html. Accessed June 10, 2020.
16. Occupational Safety and Health Administration. Best Practices Guide: Fundamentals of a Workplace First-Aid Program. 2006. https://www.osha.gov/Publications/OSHA3317first-aid.pdf.
17. Centers for Disease Control and Prevention. The CDC Worksite Health ScoreCard: An Assessment Tool for Employers to Prevent Heart Disease, Stroke, and Related Health Conditions. 2014. https://www.cdc.gov/dhdsp/pubs/docs/hsc_manual.pdf.
18. Kette F et al. The Importance of Automated External Defibrillation Implementation Programs. Milano: Springer; 2014.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C15 B EMERGENCY RESILIENCE AND RECOVERY | O (MAX : 4 PT)

Intent : Better enable individuals and communities to maintain health and well-being, and organizations to maintain business function, during and after emergencies.

Summary : This WELL feature requires projects to create a business continuity plan, establish a re-entry plan and offer supportive resources to facilitate resilience during, and recovery after, an emergency.

Issue : Today, communities must prepare for and face emergencies ranging from natural disasters, civil unrest to public health crises. Globally, the frequency, scale and economic and social cost of disasters is increasing due to climate change, population growth and rapid urbanization.[1–3] In 2019, the global economic losses from disasters amounted to $232 billion, and the 2020 COVID-19 pandemic caused the largest global recession in history.[1,4] Small businesses may be particularly vulnerable as research shows that about 90% of smaller companies fail after emergencies unless they can resume business operations within five days.[5] Emergencies such as biological events or active shooters may necessitate sheltering in the workplace, while longer-term emergencies may lead to extended workplace shutdowns.[6–13] The latter can result in extensive layoffs, while employees who continue working may be forced to work in higher-risk conditions or remotely in spaces not equipped to support productivity.[9–13]

Solutions : Business continuity planning is critical to help manage business disruption, restore business operations, minimize risk to employees and mitigate financial loss when emergencies occur.[14–17] Establishing organizational remote work readiness can help operations run smoothly and support employee well-being and productivity when an emergency makes remote work imperative.[14,18] Moreover, employer-funded employee relief assistance can support both employee retention and well-being during and after emergencies. [19–21] For emergencies that require sheltering on-site, a shelter-in-place plan is crucial to supporting occupant safety.[6,8,22] Designating space for emergency public use can reduce the burden on medical facilities and help patients receive immediate care.[23,24] Re-entry plans after emergencies should consider employee needs, offer employees flexibility, assess critical infrastructure systems, communicate re-entry strategies to key stakeholders and re-evaluate existing policies, operations and protocols to support a healthy and safe re-entry.[25–34] In certain types of emergencies, including epidemics and pandemics, re-entry plans may need to consider relevant vaccination, testing, and other requirements (as applicable), including social distancing and use of personal protective equipment in order to help manage risks.[35]

PART 1 PROMOTE BUSINESS CONTINUITY (MAX : 1 PT)

For All Spaces:

Projects implement a business continuity plan (BCP) that addresses at minimum the following:[14,18]

a. Determines critical business functions, processes, supporting resources and dependencies (e.g., email, internet connectivity, third-party suppliers or service providers, interdependent departments).

b. Includes a list of the roles and responsibilities of the business continuity team and convenes the team annually (at minimum) to review, test and update (as needed) the plan.

c. Implements a business impact analysis to evaluate the likely effects resulting from disruption of normal business functioning due to a disaster and to identify which critical business functions should be prioritized for recovery.

d. Conducts a remote work readiness assessment, including at minimum the following:

   1. Evaluates which employees and/or positions (if any) are able to work remotely.
   2. Evaluates which employees and/or positions (if any) have the necessary support infrastructure to work productively in a remote situation.
   3. Evaluates whether organizational technology (e.g., company laptops, virtual private network (VPN)) is set up to support enterprise-wide remote work.
   4. Implements the strategies necessary to support remote work readiness as determined by the evaluation, including (as applicable) methods of communication to employees during remote work and provision for alternate work locations.

e. Outlines strategies to support short- and long-term continuity in various disasters (e.g., blizzard, pandemic), restore and maintain business operations following disruption and re-mobilize in response to recurring disasters.

Note : This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 2 SUPPORT EMERGENCY RESILIENCE (MAX : 1 PT)

For All Spaces:

Projects implement at least one of the following:

a. Designated outdoor or indoor space is made available to emergency responders, relief organizations or other equivalent institutions at no cost for alternative use in case of emergency (e.g., shelter during a natural disaster, treatment area during a pandemic).

b. Funding or other resources (e.g., in partnership with local agencies providing relevant services or resources such as vouchers, shelter, clothing, food, transportation) are provided by the employer for emergency use by employees in at least two of the following critical scenarios:

   1. Sheltering from domestic violence or abuse.
   2. Quarantine due to infectious disease exposure.
   3. Damage to employee housing from a disaster.

c. Shelter-in-place plan for emergencies in which occupants cannot leave the project (e.g., hurricane, chemical spill) that includes the following:

   1. A shelter-in-place kit with resources to help occupants shelter in place within the project for at least 24 hours (e.g., water, food supplies, blankets, flashlights, first aid kit).[8]

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

2. A process for occupants or groups who may be more vulnerable (e.g., older adults, people with disabilities, pregnant women, children) to confidentially identify specific needs they may have during a shelter-in-place emergency.[22]
3. Procedures for communicating to occupants the decision to evacuate or shelter-in-place during an emergency.
4. A commitment to incorporate shelter-in-place guidelines provided by a relevant local-, regional- or global-level emergency response agency (e.g., WHO, government emergency management agency or equivalent) into the plan, and to adhere to instructions provided by that agency during a shelter-in-place emergency.
5. Annual (at minimum) occupant trainings on the shelter-in-place plan.

Note : This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 3 FACILITATE HEALTHY RE-ENTRY (MAX : 1 PT)

For All Spaces:

Projects establish a plan for re-entry into the project after an emergency (e.g., natural disaster, public health emergency) addressing at minimum the following:

a. Consultation with regular occupants before and after re-entry to understand their needs and concerns related to re-entry.
b. Safety, compliance and risk inspections of water, mechanical, electrical, ventilation and life safety systems, including necessary actions to restart building and facility systems after prolonged shutdown and approval or clearance for safe re-entry, as applicable.
c. A list of roles for those who will be responsible for overseeing the re-entry plan. While roles and contact information should be made available to an organization's personnel, it is not necessary to include this information in the plan submitted for purposes of verifying this feature.
d. Re-evaluation and adjustment (as needed) of human resources, workplace wellness and employee support policies and amenities (e.g., use of common areas and shared spaces like wellness rooms, food provision, physical activity programs) to support a safer and healthier re-entry.
e. Policy to support phased re-entry (as needed) offering part-time options, work from home flexibility and/or flexible schedules for all employees (as feasible), particularly for parents and caregivers who may have specific dependencies (e.g., due to childcare closures or a sick family member) and vulnerable groups (e.g., people with disabilities or who may be particularly vulnerable to infectious disease).
f. Re-evaluation and adjustment (as needed) of facilities management policies and organizational protocols to support safer and healthier re-entry, including but not limited to:
    1. Crowd management and spacing and physical distancing of individuals.
    2. Heightened security measures (e.g., screening, security personnel).
    3. Access to personal protective equipment (PPE).
    4. Additional sanitization supplies and other cleaning or maintenance protocols.
g. Contingency planning and re-closure measures should the same hazard that forced initial closure re-occur.
h. Frequent communications through multiple methods (e.g., emails, signage, trainings) to all relevant stakeholders, including (as applicable) employees, occupants, residents, facilities management team, contractors and community members, on the re-entry plan, new or altered policies, operations and procedures, relevant local-, state-, national- or global-level re-entry guidelines and how the project will address occupant health and safety concerns.
i. Evaluation and incorporation of re-entry guidelines (as available) provided by a relevant local-, regional- or global-level emergency response agency (e.g., WHO, government emergency management agency or equivalent) into the plan, and adherence to instructions provided by that agency during re-entry.

Note : This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 4 ESTABLISH HEALTH ENTRY REQUIREMENTS (MAX : 1 PT)

For All Spaces except Dwelling Units:

Projects located in a region with heightened risk of infectious respiratory disease transmission defined by a public health authority (e.g., World Health Organization, local public health agency) require at least one of the following for regular occupants to enter the space:

a. Proof of vaccination or documented exemption (e.g., a medical or religious exemption), including necessary

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

boosters as applicable, for the disease of heightened risk.

b. Both of the following:

   1. Proof of negative diagnostic testing for the disease of heightened risk and, for eligible employees (as applicable), access to diagnostic testing at no cost.
   2. Face masks worn indoors by, at minimum, unvaccinated occupants. Face masks are available for all occupants.[36]

Note : This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. Weather, Climate & Catastrophe Insight.; 2019. http://catastropheinsight.aon.com. Accessed June 4, 2020.
2. Coronese M, Lamperti F, Keller K, Chiaromonte F, Roventini A. Evidence for sharp increase in the economic damages of extreme natural disasters. Proc Natl Acad Sci U S A. 2019;116(43):21450-21455. doi:10.1073/pnas.1907826116
3. Global Increase in Climate-Related Disasters.; 2015. https://www.adb.org/publications/global-increase-climate-related-disasters. Accessed June 4, 2020.
4. International Monetary Fund. World Economic Outlook, April 2020: The Great Lockdown.; 2020. https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020. Accessed June 4, 2020.
5. FEMA. Make Your Business Resilient.; 2015. https://www.fema.gov/media-library-data/1441212988001-1aa7fa978c5f999ed088dcaa815cb8cd/3a_BusinessInfographic-1.pdf.
6. Evacuation Plans and Procedures eTool | Emergency Action Plan - Shelter-in-Place | Occupational Safety and Health Administration. https://www.osha.gov/SLTC/etools/evacuation/shelterinplace.html. Accessed June 4, 2020.
7. CDC Emergency Preparedness and You | Learn How to Shelter in Place. https://emergency.cdc.gov/shelterinplace.asp. Accessed June 3, 2020.
8. Build A Kit | Ready.gov. https://www.ready.gov/kit. Accessed June 3, 2020.
9. Coronavirus Makes Work from Home the New Normal. https://www.shrm.org/hr-today/news/all-things-work/pages/remote-work-has-become-the-new-normal.aspx. Accessed June 4, 2020.
10. COVID-19: Making remote work productive and secure: PwC. https://www.pwc.com/us/en/library/covid-19/making-remote-work-productive-secure.html. Accessed June 4, 2020.
11. Kluch S, Hickman A. 4 Workplace Adjustments to Help Parents Working From Home.; 2020. https://www.gallup.com/workplace/300662/workplace-adjustments-help-parents-working-home.aspx. Accessed June 4, 2020.
12. Willis Towers Watson. North American companies take steps to protect employees from coronavirus epidemic. 2020. https://www.willistowerswatson.com/en-US/News/2020/03/north-american-companies-take-steps-to-protect-employees-from-coronavirus-epidemic. Accessed June 4, 2020.
13. KFF. Taking Stock of Essential Workers | KFF. https://www.kff.org/coronavirus-policy-watch/taking-stock-of-essential-workers/. Published 2020. Accessed June 4, 2020.
14. Business Continuity Plan | Ready.gov. https://www.ready.gov/business-continuity-plan. Published 2020. Accessed May 29, 2020.
15. U.S. Small Business Administration. Disaster Preparedness and Recovery Plan.; 2019. https://www.sba.gov/sites/default/files/2019-08/2019 DPRP 3-2b-FINAL.pdf. Accessed June 4, 2020.
16. American Red Cross Ready Rating. SMB Prepared Playbook. 2015. https://www.readyrating.org/Resource-Center/All-Resources/smb-prepared-playbook. Accessed June 4, 2020.
17. Emergency Management Agency F. Continuity Guidance Circular - February 2018.; 2018.
18. Goldman SB. PANDEMIC MANUAL Planning and Responding to a Global Health Crisis for Facility Management Professionals.; 2020. www.ifmafoundation.org. Accessed June 4, 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

19. Emergency Relief Funds Throw Employees a Lifeline During Pandemic. https://www.shrm.org/resourcesandtools/hr-topics/benefits/pages/emergency-relief-funds-throw-employees-lifeline-during-pandemic.aspx. Accessed June 4, 2020.
20. Employer-Assisted Housing: The Basics | National Housing Conference. https://www.nhc.org/policy-guide/employer-assisted-housing-the-basics/. Accessed June 4, 2020.
21. Stockham D, Clontz B. Emergency Assistance Funds (EAFs) for Employee Hardship and Disaster Relief: Legal, Tax and Design Considerations. 2015. https://www.pgdc.com/pgdc/emergency-assistance-funds-eafs-employee-hardship-and-disaster-relief-legal-tax-and-design-cons. Accessed June 9, 2020.
22. Federal Emergency Management Agency. Every Business Should Have a Plan. 2014. https://www.fema.gov/media-library-data/1388786699366-f6593a40cee347ce4a8def70a28b748e/Business_quadfold_brochure_2012.pdf.
23. 23. America Society of Civil Engineers. Alternate Care Sites Retrofitting Guidance. https://www.usace.army.mil/Coronavirus/Alternate-Care-Sites/. Published 2020. Accessed June 4, 2020.
24. CDC. Considerations for Alternate Care Sites | CDC. https://www.cdc.gov/coronavirus/2019-ncov/hcp/alternative-care-sites.html. Published 2020. Accessed June 4, 2020.
25. CDC. COVID-19 Guidance: Businesses and Employers | CDC. https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fspecific-groups%2Fguidance-business-response.html. Published 2020. Accessed June 8, 2020.
26. HMG. Our Plan to Rebuild: The UK Government's COVID-19 Recovery Strategy.; 2020.
27. 27. PricewaterhouseCoopers. Returning to the workplace after COVID-19: What boards should be thinking about: PwC. https://www.pwc.com/us/en/services/governance-insights-center/library/covid-19-returning-workplace-boards.html. Published 2020. Accessed June 4, 2020.
28. Society of Occupational Medicine. Returning to the Workplace after the COVID-19 Lockdown.; 2020. https://www.som.org.uk/Returning_to_the_workplace_COVID-19_toolkit_FINAL.pdf. Accessed June 3, 2020.
29. Recovery Readiness: A How-to Guide for Reopening Your Workplace | Cushman & Wakefield.; 2020. https://www.cushmanwakefield.com/en/insights/covid-19/recovery-readiness-a-how-to-guide-for-reopening-your-workplace. Accessed June 9, 2020.
30. GUIDANCE FOR CLEANING AND DISINFECTING.; 2020. https://www.cdc.gov/coronavirus/2019-ncov/community/pdf/Reopening_America_Guidance.pdf. Accessed June 9, 2020.
31. Getting Back to Work: Preparing Buildings for Re-Entry Amid COVID-19.; 2020. https://boma.informz.net/BOMA/data/images/Getting Back To Work Preparing Buildings for Re Entry.pdf. Accessed June 9, 2020.
32. Getting Your Workplace Ready for COVID-19.; 2020. www.WHO.int. Accessed June 9, 2020.
33. Re-Occupancy Assessment Tool V2.0.; 2020. http://content.aia.org/sites/default/files/2020-06/STN20_344901_ReOccupancyAssessmentTool-V02_sm_v09.pdf. Accessed June 9, 2020.
34. Guidance on Preparing Workplaces for COVID-19.; 2020. https://www.osha.gov/Publications/OSHA3990.pdf. Accessed June 9, 2020.
35. Nelson C, Lurie N, Wasserman J, Zakowski S. Conceptualizing and defining public health emergency preparedness. Am J Public Health. 2007;97 Suppl 1(Suppl 1):S9-S11. doi:10.2105/AJPH.2007.114496
36. Centers for Disease Control and Prevention. Guidance for Businesses and Employers Responding to Coronavirus Disease 2019 (COVID-19).

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C16 B AFFORDABLE HOUSING | O (MAX : 2 PT)

Intent : Promote health and well-being by increasing access to safe and affordable housing.

Summary : This WELL feature requires projects to designate affordable housing units that are tenure blind, reduce housing costs for low-income tenants and offer multi-bedroom options.

Issue : Families unable to find affordable housing spend a significant share of their income on housing costs, leaving insufficient resources to cover other basic needs such as food, clothing, utilities and medical care.[1–3] Across the United States, European Union, Japan and Australia, over 60 million households are financially stretched by housing costs. [4] With lack of affordable housing access, an estimated 235 million urban families live in substandard housing, which exposes them to mold, dust, water leaks, lead-based paint, poor air quality, temperature extremes and vermin, leading to poor health outcomes like asthma, infectious disease, cardiovascular events and children's nervous system damage.[1–3 5,6] In 2016, only 3.2 million affordable housing units were available for the 10.4 million extremely low-income households in the United States; in India, there is a deficit of 11 million affordable units.[7,8] In rural England, only 8% of housing stock is affordable compared to 20% in urban areas.[9] Affordable housing shortages lead to homelessness, which increases stress, substance use and morbidity in adults and mental health issues and depression in youth.[3,6,10]

Solutions : Increasing housing affordability, quality and safety improves resident health, feelings of security and self-esteem, and increases developmental ability and nutrition levels in children.[3,6] Affordable housing access can help prevent communicable diseases, improve overall health and provide a stable and efficient platform for the delivery of food, healthcare and essential services, especially for vulnerable groups such as the elderly, children, and individuals with chronic illnesses or disabilities.[1,3,5,6,10] With rising urbanization, healthy affordable housing will be critical for community health promotion.

PART 1 ALLOCATE AFFORDABLE HOUSING (MAX : 2 PT)

For Dwelling Units:

The project meets the following requirements:

a. A percentage of dwelling units are allocated for tenants whose incomes are at or below an income limit relative to the local median household income [e.g., Area Median Income (AMI)] and adjusted for family size. Recognition is awarded as per the selected tier in the table below:

Tier	Units Allocated and Income Limited	Point Value
1	20% of units or more, 0 - 50% of local median OR 40% of units or more, 51 - 80% of local median	1 point
2	100% of units, 0 - 80% of local median	2 points

b. Total annual housing costs (i.e., rent and utilities) paid by affordable unit tenants are less than 30% of the income limit selected in requirement (a).

c. Housing costs are maintained at the levels described in this feature for the duration of a project's engagement with WELL.

d. Affordable housing units are not visually or functionally distinctive from market-rate units (if present) and have the same access point into the building.

e. In projects with 10 or more affordable housing units, at least 50% of allocated units have two or more bedrooms and at least 10% of allocated units have three or more bedrooms.

Note : This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. Housing Instability | Healthy People 2020.
2. Health Impact Assessment and Housing | The Pew Charitable Trusts.
3. Maqbool N, Viveiros J, Ault M. The Impacts of Affordable Housing on Health : A Research Summary.; 2007.
4. Woetzel J, Ram S, Mischke J, Garemo N, Sankhe S. A Blueprint for Addressing the Global Affordable Housing Challenge.; 2014.
5. The Positive Impacts of Affordable Housing on Health: A Research Summary | Enterprise Community Partners.
6. Taylor L. "Housing And Health: An Overview Of The Literature, " Health Affairs Health Policy Brief. Health Aff. 2018. doi:10.1377/hpb20180313.396577
7. APHA. Housing and Homelessness as a Public Health Issue. American Public Health Association.
8. Bank W. Country partnership framework for Zambia.
9. Baxter D, Murphy L. A NEW RURAL SETTLEMENT FIXING THE AFFORDABLE HOUSING CRISIS IN RURAL ENGLAND The Progressive Policy Think Tank.; 2018.
10. Kottke T, Abariotes A, Spoonheim JB. Access to Affordable Housing Promotes Health and Well-Being and Reduces Hospital Visits. Perm J. 2017;22. doi:10.7812/TPP/17-079

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C17 B RESPONSIBLE LABOR PRACTICES | O (MAX : 3 PT)

Intent : Promote organizational commitment to responsible labor practices in order to address modern slavery in the supply chain and support human rights.

Summary : This WELL feature requires projects to evaluate and disclose unfair labor practices associated with modern slavery in their operations and supply chain, specifically in the areas of construction, cleaning and catering, and to take steps to address modern slavery in the supply chain.

Issue : Modern slavery refers to the various situations in which a person is recruited, transported or compelled to work through force, fraud or coercion. [1,2] Modern slavery practices may include traditional slavery (or involuntary servitude), human trafficking, forced labor, bonded labor, sex trafficking and the worst forms of child labor.[1,2] The Global Slavery Index estimates that in 2016 there were over 40 million victims of modern slavery worldwide, including 24.9 million in forced labor.[3] Modern slavery is recognized as a violation of human rights, including a right to health, and as a global public health issue.[4–7] Research shows modern slavery has severe consequences for victim health and well-being, including high risk of physical injury, mental health issues like anxiety, depression and post-traumatic stress disorder (PTSD), exposure to infectious disease, suicide and limited access to healthcare.[4–7] Reports estimate that a majority of modern slavery victims – nearly 30 million – reside in the Asia Pacific region, where many global supply chains lead.[8–10] Of the 195 countries in the world, only 40 have investigated labor exploitation in supply chains and almost half of all countries worldwide have yet to criminalize slavery.[11,12] Industries found to be at highest risk for modern slavery include clothing, electronics and technology manufacturing, food and agriculture (including catering), and construction.[13,14] The cleaning sector is also considered high-risk given the complexity and opaque operations of the industry; in 2011, the Fair Work Ombudsman (FWO) reported that out of 315 Australian cleaning companies analysed, 37.1% were non-compliant with responsible labor practices, including underpayment of wages and lack of recordkeeping.[14,15] Businesses often do not sufficiently assess modern slavery risks in their supply chains due to the complexity of supply chains reaching across sectors and regions; for example, in 2016 only 47% of UK manufacturers had adequately identified all of the suppliers in their supply chain.[13,14]

Solutions : Businesses can play a critical role in helping to identify and prevent occurrences of modern slavery. [16] To address modern slavery in the supply chain, companies must first establish due diligence processes that comprehensively detect risks and influencing conditions.[14] The UK Modern Slavery Act of 2015 requires companies to establish and disclose a risk assessment process, anti-slavery policies and steps taken to address identified risks.[17] The Australian Modern Slavery Act of 2018 similarly requires entities to publish an annual report on actions they have taken to address modern slavery in their operations and supply chains.[18] Best practices also include ethical procurement policies, employee training on relevant policies and risk identification as well as engagement with Tier 1 suppliers and established processes for incident reporting, while "leadership" approaches include standalone modern slavery or human rights policies, deeper risk assessments into Tier 2 suppliers through Tier 6 suppliers, capability-building with suppliers, strong remediation mechanisms and slavery-specific performance metrics.[13,19] Implementing these steps also supports the achievement of U.N. Sustainable Development Goal 8: Decent Work and Economic Growth, which calls for eradicating forced labor, modern slavery, human trafficking and child labor by 2025.[20]

PART 1 DISCLOSE LABOR PRACTICES (MAX : 1 PT)

For All Spaces:

The project or organization meets the following requirements:

a. A comprehensive mapping of the project's or organization's structure, operations and supply chains is conducted annually for Tier 1 suppliers in the following sectors (as applicable):[21]
    1. Construction.
    2. Cleaning.
    3. Catering.
    4. Security.
    5. Maintenance.
b. A risk assessment is conducted annually that evaluates risks in the project's or organization's operations and Tier 1 suppliers (at a minimum) in the above sectors for the following practices associated with modern slavery:[21,22]
    1. Worst forms of child labor.
    2. Forced labor.
    3. Traditional slavery.
    4. Bonded labor.
    5. Human trafficking.
c. A report is completed annually that discloses the following information, is reviewed by executives in the C-Suite, board of directors and/or equivalent high-level stakeholders, and published on the project or organization's website:[22]
    1. Processes of evaluation and risk assessment.
    2. Results of evaluation or risk assessment, including where modern slavery risks have been identified.
    3. Statement of commitment (including established goals and policies) aimed at identifying, preventing and mitigating modern slavery practices in the project's or organization's operations and supply chain.

Note : This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 2 IMPLEMENT RESPONSIBLE LABOR PRACTICES (MAX : 2 PT)

Note : Projects may only achieve this part if Part 1 is also achieved.

For All Spaces:

The project or organization implements an action plan that meets the following requirements:[21,22]

a. Establishes annual targets for the prevention and/or mitigation of modern slavery in their operations and supply chain in the following areas (as applicable):
    1. Construction.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

2. Cleaning.
3. Catering.
4. Security.
5. Maintenance.

b. Describes how the effectiveness of the implemented strategies are assessed annually and updates targets and/or strategies accordingly.[21]

c. Addresses implementation of the following strategies to meet established targets:[21,22]

1. Anti-slavery and anti-human trafficking policies.
2. Responsible procurement policies.
3. Annual trainings, mandatory for employees involved in procurement and made available to all employees, educating about the consequences of modern slavery and the project or organization's policies and steps for preventing, identifying and reporting observed or potential incidences of modern slavery practices.
4. Reporting protocol that allows employees and supply chain Tier 1 suppliers to anonymously report modern slavery risks and practices.
5. Process for review and remediation of any identified modern slavery practices to prevent and mitigate future incidents.
6. Process for consultation and revision of contracts, including establishing supplier obligations to address modern slavery, with any suppliers that have been identified as high risk for modern slavery practices.

d. The requirements in a, b and c are met for supply chain Tiers according to the table below.

Feature Tier	Supplier Level	Point Value
1	Supply Chain Tier 1	1 point
2	At least Supply Chain Tiers 1 & 2	2 points

Note : This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. Parliament of Australia. Defining and measuring modern slavery. https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Foreign_Affairs_Defence_and_Trade/ModernSl id=committees%2Freportjnt%2F024102%2F25035. Accessed May 19, 2020.
2. What is Modern Slavery? - United States Department of State. https://www.state.gov/what-is-modern-slavery/. Accessed August 5, 2020.
3. Highlights | Global Slavery Index. https://www.globalslaveryindex.org/2018/findings/highlights/. Accessed May 19, 2020.
4. Such E, Walton E, Bonvoisin T, Stoklosa H. Modern slavery: A global public health concern. BMJ. 2019;364. doi:10.1136/bmj.l838
5. Turner PJ, Jerschow E, Umasunthar T, Lin R, Campbell DE, Boyle RJ. Fatal Anaphylaxis: Mortality Rate and Risk Factors. J Allergy Clin Immunol Pract. 2017;5(5):1169-1178. doi:10.1016/j.jaip.2017.06.031
6. Zimmerman C, Kiss L. Human trafficking and exploitation: A global health concern. PLOS Med. 2017;14(11):e1002437. doi:10.1371/journal.pmed.1002437
7. Ottisova L, Hemmings S, Howard LM, Zimmerman C, Oram S. Prevalence and risk of violence and the mental, physical and sexual health problems associated with human trafficking: An updated systematic review. Epidemiol Psychiatr Sci. 2016;25(4):317-341. doi:10.1017/S2045796016000135
8. Asia and the Pacific | Global Slavery Index.; 2018. https://www.globalslaveryindex.org/2018/findings/regional-analysis/asia-and-the-pacific/. Accessed August 6, 2020.
9. Global Estimates of Modern Slavery . Geneva; 2017. https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/publication/wcms_575479.pdf. Accessed August 6, 2020.
10. Modern Slavery - Supply Chain Sustainability School. https://www.supplychainschool.org.au/learn/modern-slavery/. Accessed May 19, 2020.
11. Executive Summary | Global Slavery Index. https://www.globalslaveryindex.org/2019/findings/executive-summary/. Accessed May 19, 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

12. Schwarz DK, Allain J. Antislavery in Domestic Legislation.; 2020.
13. SAI Global. Modern Slavery in the Supply Chain: Identifying and Safeguarding the Major Risk Areas.; 2016. https://www.saiglobal.com/en-au/news_and_resources/industry_news/emea_modernslavery_whitepaper_09_16/.
14. Australian Council of Superannuation Investors, KPMG. Modern Slavery Risks, Rights & Responsibilities A GUIDE FOR COMPANIES AND INVESTORS.; 2019. https://acsi.org.au/wp-content/uploads/2020/01/ACSI-Modern-Slavery-Report.Feb19.pdf. Accessed May 19, 2020.
15. Fair Work Ombudsman. National Cleaning Services Campaign 2010-11.; 2011.
16. MODERN SLAVERY IN COMPANY OPERATIONS AND SUPPLY CHAINS. www.business-humanrights.org. Accessed May 19, 2020.
17. 2018 UK Annual Report on Modern Slavery.; 2018. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/749346/2018_U Accessed May 19, 2020.
18. Modern Slavery Act 2018. Federal Register of Legislation - Australian Government; 2018. https://www.legislation.gov.au/Series/C2018A00153. Accessed July 22, 2020.
19. PWC. Modern Slavery Reporting in Australia.; 2019. https://www.pwc.com.au/pdf/modern-slavery-reporting-in-australia_v2.pdf. Accessed May 26, 2020.
20. Goal 8 .:. Sustainable Development Knowledge Platform. https://sustainabledevelopment.un.org/sdg8. Accessed May 26, 2020.
21. McGregor A, Vickery G. Food for Thought: The Modern Slavery Act's Impact in Fresh Food Retail, Wholesale and Agriculture.; 2017. https://www.nortonrosefulbright.com/en-au/knowledge/publications/9cb18e6c/food-for-thought-the-modern-slavery-acts-impact-in-fresh-food-retail-wholesale-and-agriculture#autofootnote8. Accessed May 26, 2020.
22. Walk Free Foundation, Chartered Institute of Purchasing & Supply, Verité. TACKLING MODERN SLAVERY IN SUPPLY CHAINS A GUIDE 1.0.; 2014. https://www.cips.org/Documents/Knowledge/Procurement-Topics-and-Skills/4-Sustainability-CSR-Ethics/Sustainable-and-Ethical-Procurement/tackling-modern-slavery-in-modern-supply-chains.pdf. Accessed May 26, 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C18 B SUPPORT FOR VICTIMS OF DOMESTIC VIOLENCE | O (MAX : 2 PT)

Intent : Increase availability and access to support services, resources and care for victims of domestic violence.

Summary : This WELL feature requires projects to implement a policy that supports victims of domestic violence and to educate employees on the domestic violence resources that are made available by the project.

Issue : Domestic violence is the most common form of gender-based violence across the world.[1] Women are disproportionately affected, with violence most commonly perpetrated by men against women.[2] The World Health Organization estimates that around 30% of women who have been in a relationship experience some form of physical and/or sexual violence perpetrated by an intimate partner.[1] The impact of this violence is severe: globally, it is estimated that up to 38% of murders of women are committed by a male intimate partner. [1] Beyond fatal outcomes, domestic violence can lead to a range of adverse health consequences, including higher risk of injuries, sexually transmitted infections (including HIV), depression, anxiety and substance misuse.[1] Moreover, the social and economic consequences of domestic violence are significant, including loss of wages and inability to work, as well as increased risk of homelessness.[1,3,4] The deep impacts of domestic violence are not just felt at home, but also carried into the workplace: research shows that at work, victims are more likely to have reduced performance and productivity and increased absenteeism and turnover.[5,6]

Solutions : Workplaces can play a role in responding to domestic violence through policies designed to protect and support victims. [5–8] It is also important for workplaces to develop supportive and non-judgemental environments in which employees feel comfortable and safe disclosing any violent situation they may be facing.[7] Employers can help protect victims through various measures, such as confidential protocols for reporting, reviewing and responding to an incident, ability to change workplace location and start and finish times, increased security for workplace access, call screening procedures and specific emergency response procedures.[5,7,8] Countries such as New Zealand, the Philippines and parts of Canada have introduced legislation that promotes best practices among employers to support victims of domestic violence, including paid time off for victims and financial resources to support relocation.[9–11] By providing policies and resources to support victims and educate employees, employers may play a role in helping to reduce the physical and mental impacts of domestic violence.[7,12]

PART 1 SUPPORT VICTIMS OF DOMESTIC VIOLENCE (MAX : 2 PT)

For All Spaces:

1: Domestic violence policy

The project or organization makes available to all eligible employees a domestic violence policy that meets the following requirements:

a. Provides employees who are victims of domestic violence at least ten days of leave, paid at the employee's full salary or wages, during any 12-month period. Leave must meet the following requirements:[5,7,8,12]
    1. Distinct from paid time off, sick leave and family leave.
    2. If requiring incident disclosure for employees to qualify, takes steps to protect employee privacy.
    3. Does not require a prerequisite minimum qualifying period of employment before an employee is eligible to take leave.
b. Outlines a clear protocol for incident reporting and response that includes the following:
    1. Process for employees to confidentially report incidents of domestic violence, including one or more designated contacts that employees can approach confidentially for support when reporting incidents.[8]
    2. Process of incident response that includes consultation with the victim, prioritizes victim privacy and safety and ensures incident disclosure will not adversely impact victim employment status.
c. Offers employees who report domestic violence incidents at least two of the following:
    1. Flexible working arrangements (e.g., adjusted work hours or location).[5,7,8,12]
    2. Heightened security measures (e.g., call screenings, controlled workplace access, duress alarms, changes to contact information, worksite security escorts).[2,5,8]
    3. Referrals to local support organizations, community groups and crisis lines, including those available through Employee Assistance Programs (EAPs).[8,12]
    4. Temporary accommodations or financial support to cover the costs of temporary accommodations.[5]
d. Policy and related resources provided by the organization are easily and confidentially available (e.g., via a health portal, mailed communications, employee website) to all employees and reviewed and adjusted (as needed) annually by the organization. Policy must be made available to all new employees during onboarding.[2,5]

2: Employee education

The project or organization offers in-person or virtual trainings (e.g., workshops, seminars) that meet the following requirements:

a. Are required of all managers and made available to all employees.[2,8]
b. Covers the following topics:[7,12]
    1. The relevant domestic violence policy and resources.
    2. Signs and symptoms that a person may be a victim of domestic violence.
    3. How to appropriately respond if a colleague or direct report discloses that they or another employee is experiencing domestic violence.

Note :

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

world.

REFERENCES

1. World Health Organization. Violence against women. https://www.who.int/en/news-room/fact-sheets/detail/violence-against-women. Published 2017. Accessed September 25, 2020.
2. WorkSafe Victoria. Addressing family violence in the workplace. https://www.worksafe.vic.gov.au/addressing-family-violence-workplace. Published 2019. Accessed September 25, 2020.
3. American Civil Liberties Union. *Domestic Violence and Homelessness.*; 2006. https://www.aclu.org/sites/default/files/pdfs/dvhomelessness032106.pdf. Accessed September 25, 2020.
4. The World Bank. *WOMEN, BUSINESS AND THE LAW 2016.*; 2015. doi:10.1596/978-1-4648-0677-3
5. United Nations Women - National Committee Australia. *Taking the First Step: Workplace Responses to Domestic and Family Violence.*; 2017. https://unwomen.org.au/wp-content/uploads/2015/12/Taking_the_First_Step_UNWNCA_Report.pdf. Accessed September 25, 2020.
6. Wathen CN, MacGregor JCD, MacQuarrie BJ. The Impact of Domestic Violence in the Workplace: Results from a Pan-Canadian Survey. *J Occup Environ Med*. 2015;57(7):e65-e71. doi:10.1097/JOM.0000000000000499
7. Vodafone Foundation. *Domestic Violence and Abuse: Working Together to Transform Responses in the Workplace.*; 2019. https://pdfslide.net/documents/domestic-violence-and-abuse-working-together-to-for-good-vodafone-foundation.html. Accessed September 25, 2020.
8. Public Health England. *Domestic Abuse: A Toolkit for Employers.*; 2019. https://www.bitc.org.uk/wp-content/uploads/2019/10/bitc-wellbeing-toolkit-domesticabuse-dec2018.pdf. Accessed September 25, 2020.
9. *REPUBLIC ACT NO. 9262 AN ACT DEFINING VIOLENCE AGAINST WOMEN AND THEIR CHILDREN, PROVIDING FOR PROTECTIVE MEASURES FOR VICTIMS, PRESCRIBING PENALTIES THEREFORE, AND FOR OTHER PURPOSES*. Republic of the Philippines; 2004.
10. *Family Violence Act 2018 No 46 (as at 07 August 2020), Public Act Contents – New Zealand Legislation.*; 2018. http://legislation.govt.nz/act/public/2018/0046/latest/DLM7159322.html?search=ts_act%40bill%40regulation%40deemedreg_family+violence+act_resel_25_a&p=1. Accessed September 25, 2020.
11. Government of Alberta. *RSA 2000, c P-27 | Protection Against Family Violence Act*. Alberta: CanLII; 2018. https://www.canlii.org/en/ab/laws/stat/rsa-2000-c-p-27/134827/rsa-2000-c-p-27.html. Accessed September 25, 2020.
12. Fact sheet: Domestic and family violence - a workplace issue, a discrimination issue | Australian Human Rights Commission. https://humanrights.gov.au/our-work/sex-discrimination/publications/fact-sheet-domestic-and-family-violence-workplace-issue. Accessed September 25, 2020.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C19 B EDUCATION AND SUPPORT | O (MAX : 2 PT)

Intent : Support career growth by reducing educational and professional advancement barriers.

Summary : This WELL feature requires financial support for education and/or mentoring opportunities to support career advancement and financial stability.

Issue : Creating supportive programs for education, mentorship and sponsorship can positively impact employee financial health and opportunities. [1] Such support can have short and long-term effects on many dimensions of an employee's life and can benefit other members of their immediate family including spouses, children and parents.[2] Discrimination and bias result in differences in access to economic, social and educational support have historically kept marginalized populations from achieving gainful employment.[3,4] Financial wellness also impacts mental health, housing stability and food security.[5]

Solutions : Research shows that minorities and women benefit from peer-to-peer mentors and sponsors who champion them. [4,6,7] Sponsors provide a deeper level of mentorship to their protegees.[8] Through exposure and relationships, they provide career advancement opportunities for the protegee when they are "in and out of the room". [8] Mentorship develops trust between the two parties, creating a foundation for a successful relationship between mentor and mentee.[4] Mentorship surveys also reveal satisfaction amongst employees within such programs – in the United States, 71% of employees with a mentor say their company provides them with excellent or good opportunities to advance their careers.[7] Employees may also benefit from other support options such as speaker sessions, workshops and seminars.[9] Guest speakers can help advance professional development, spark new ideas and offer follow-up training opportunities.[10] Providing subsidized financial assistance to promote education for marginalized populations may create more opportunities for career advancement and, therefore, bring greater financial stability for individuals and their families.[11-13] Research from the United States found that 80% of employees agreed that their employer's tuition assistance program makes them more likely to stay with the organization, and 71% of respondents rated tuition assistance as the best or among the best benefits offered by their employer (excluding health care benefits).[1,14] Financial assistance for education and peer-to-peer mentorship positively impacts all employees, and in particular, individuals who have historically had more barriers to education and professional development.[7,13]

PART 1 ESTABLISH EDUCATION AND SUPPORT (MAX : 2 PT)

For All Spaces:

Option 1: Tuition assistance

The project or organization provides a Tuition Assistance Program (TAP), which may be limited to select institutions, to all eligible employees that meets the following requirement:

a. Pays for a minimum of 75% of educational expenses for all enrolled courses each term/year (including tuition, program fees and books/materials) for vocational training, undergraduate, graduate, certificate courses and similar educational goals. Assistance is structured per the table below:

Tier	Tuition Assistance Structure	Point Value
1	Reimbursements for educational expenses	1 point
2	Direct payments for educational expenses	2 point

OR

Option 2: Mentorship program

The project or organization provides a mentorship or sponsorship program that meets the following requirements:

a. A process for matching mentor to mentee and/or sponsor to protégé (e.g., interest form).

b. A plan development process co-created between mentor and mentee or sponsor and protégé to identify the needs, goals and objectives. The plan should be customized and focus on individual strengths, personality, skills and workstyles.

c. A process by which mentees and protégés report on meetings between the mentor/mentee or sponsor/protégé and participation in activities recommended by the mentor or sponsor.

d. An allocated budget for specialized resources or training related to professional development (e.g., conferences, courses, assessments, workshops, group sessions) for all participating mentees and/or protégés.[15,16]

e. Mandatory training about explicit and implicit bias (in the form of educational seminars, workshops, classes or on-demand modules) for all participating employees before engagement in the program.

Note : This Option is worth 1 point

Note :

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. Discover the Employer Benefits of Tuition Reimbursement - The Quantic Blog. Accessed March 17, 2022. https://quantic.edu/blog/2021/04/26/discover-the-employer-benefits-of-tuition-reimbursement/
2. How your employees benefit from mentorship| Blue at Work from Wellmark. Accessed March 17, 2022. https://www.wellmark.com/blue-at-work/healthy-employees/mentoring-in-the-workplace

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

3. Don't Just Mentor Women and People of Color. Sponsor Them. Accessed March 17, 2022. https://hbr.org/2021/06/dont-just-mentor-women-and-people-of-color-sponsor-them
4. Promoting Diversity in the Workplace through Mentorship | Together Mentoring Software. Accessed March 17, 2022. https://www.togetherplatform.com/blog/promoting-diversity-in-the-workplace-through-mentorship
5. Financial Mental Health and Housing Stability | Wellbeing Online at WSU. Accessed March 17, 2022. https://wellbeingonline.wsu.edu/wellbeing-online/financial/financial-mental-health-and-housing-stability/
6. Nine in 10 workers who have a mentor say they are happy in their jobs. Accessed March 17, 2022. https://www.cnbc.com/2019/07/16/nine-in-10-workers-who-have-a-mentor-say-they-are-happy-in-their-jobs.html
7. Mentoring Statistics: The Research You Need To Know | Guider. Accessed March 17, 2022. https://www.guider-ai.com/blog/mentoring-statistics-the-research-you-need-to-know
8. What's the Difference Between a Mentor and a Sponsor? Accessed March 17, 2022. https://hbr.org/2021/10/whats-the-difference-between-a-mentor-and-a-sponsor
9. 5 Alternatives When You Can't Find a Good Mentor – Leading Higher. Accessed May 13, 2022. https://leadinghigher.com/5-alternatives-to-a-mentor/
10. How Guest Speakers Can Boost Your Business. Accessed May 13, 2022. https://themanifest.com/business-services/resources/how-guest-speakers-can-boost-business
11. Tuition Assistance: The Benefit That Boosts Retention - Scholarship America. Accessed March 17, 2022. https://scholarshipamerica.org/blog/tuition-assistance-the-secret-benefit-that-boosts-employee-retention/
12. Tuition Assistance Programs: The Secret Employee Benefit. Accessed March 17, 2022. https://www.forbes.com/sites/ryancraig/2016/11/03/tuition-assistance-programs-the-secret-employee-benefit/?sh=47282ab642cf
13. Student Loan Repayment Increases Diversity & Inclusion. Accessed August 29, 2022. https://www.edcor.com/wp-content/uploads/2020/01/Edcor_wp_student_loan_repayment_assistance_raises_diversity_and_inclusion.pdf
14. New Study Shows the Lasting Impact of Tuition Assistance | Business Wire. Accessed March 17, 2022. https://www.businesswire.com/news/home/20180108006550/en/New-Study-Shows-Lasting-Impact-Tuition-Assistance
15. ANSI/INFOCOMM. ANSI/INFOCOMM 10:2013 Audiovisual Systems Performance Verification. Published online 2013.
16. Downs DW, Crum MA. Processing Demands During Auditory Learning Under Degraded Listening Conditions. J Speech Hear Res. 1978;21(4):702-714.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C20 B HISTORICAL ACKNOWLEDGEMENT | O (MAX : 1 PT)

Intent : To support the health, healing and reconciliation of communities that have historically suffered as a result of colonization, displacement and relocation.

Summary : This WELL feature requires projects to develop and implement a comprehensive historical acknowledgment program that assesses the organization's impacts on the community, is informed by members of the community, includes public education, and publicly acknowledges the historical context.

Issue : Certain populations have historically been been displaced from their homelands and territories, with the threat of erasure due to imperial power dynamics, laws and decrees across the globe. These communities were the original stewards of land and biodiversity for millennia, making significant contributions to society through traditional and ancient knowledge.[1–3] On a global scale, Indigenous Peoples and people across the African diaspora have witnessed their rightful and sacred lands being taken against their will through Doctrine of Discovery, broken agreements, and abuse of eminent domain and legal constructs such as heirs' property laws.[4–6] In the United States, Asian and African American communities have made significant contributions to the building of the country through forced and unjust labor.[2,3] In addition, significant contributions through forced labor have occurred in South America and the Caribbean region.[6–9] The harmful impacts of global colonization have led to disparities in physical, mental, emotional and economic well-being, long-term displacement, erased histories, and a breakdown of community, social and economic structures, the effects of which have passed down through generations.[1,10–12] Studies have shown this has caused historical trauma and that the mental health of Indigenous youth still suffers on the Historical Loss Scale.[13] This intergenerational trauma has been found in DNA at the cellular level.[14] In Australia, New Zealand and North America, recent truth and reconciliation acknowledgments, laws and reparations have begun for Indigenous People who have suffered various human rights violations, including land rights abuse and attempted genocide.[4,12,15] It is important that organizations work with representatives from within the affected community and/or Tribal Nation to ensure that their acknowledgement and reconciliation and/or reparations programs do no harm, as defined by the community.

Solutions : This feature seeks to acknowledge and begin reconciliation for at least a portion of the valuable contributions from affected populations by encouraging healing and connection that is grounded in place and culturally-relevant values.[16–20] The act of reconciliation illuminates and drives awareness of historical contributions of marginalized and colonized communities through action and future-facing programs (i.e., land acknowledgments, truth and reconciliation practices, empowerment programs, financial relief and economic development).

PART 1 PROVIDE HISTORICAL ACKNOWLEDGEMENT (MAX : 1 PT)

For All Spaces:

The project or organization develops and implements a comprehensive historical acknowledgment program that meets the following requirements:

a. Review land deeds, historical records, census data or other credible sources (e.g., articles, websites, surveys) to identify a community that has historically suffered as a result of colonization, displacement and relocation.

b. Conduct an assessment to determine if any of the organization's current practices or policies are harmful to the community receiving acknowledgment, including, at a minimum, the following:

   1. Discriminatory and harmful labor practices and the implicit biases, policies and structures that lead to them, including those impacting consultants and subcontractors (e.g., collaborative partnerships that may cause representational damage, poor working conditions, participation in modern slavery and privatized prison labor, salary inequity, discriminatory hiring practices and/or lack of representation in leadership).
   2. Occupancy on sacred land (e.g., burial sites, spiritual sites), land protected treaty or agreement (e.g., hunting and gathering rights), or seized land (e.g., by use of eminent domain).
   3. Practices that negatively impact all life and the environment, especially those in closest proximity to the project site (e.g., pollution, deforestation, poor waste management practices).

c. Create a program for historical acknowledgement that:

   1. Is informed by members and leaders of the community and/or Tribal Nation, as identified through one or more meetings with community representatives.
   2. Acknowledges the beliefs and practices of the community and/or Tribal Nation.
   3. Promotes engagement including reconciliation and/or reparations (as applicable) between the organization and the community and/or Tribal Nation.
   4. Identifies a minimum three-year plan of action for how the organization will develop a meaningful relationship with the community and/or Tribal Nation that will benefit the community (e.g., employment incubator, mental health support, funding agreement, education opportunities, returning land or property).
   5. Includes a signed document acknowledging the partnership demonstrating the program was co-created between the organization and the community and/or Tribal Nation.

d. Develop a communication plan in a physical or electronic format that provides:

   1. Education for employees and the general public about the community and/or Tribal Nation's historical contribution to society.
   2. Background on the historical acknowledgement program and its development, as well as opportunities for employees to engage with the plan of action.

e. Express historical context publicly through at least one of the following methods:

   1. Mission statement
   2. Monument
   3. Proclamation
   4. Educational display

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

5. Plaque
6. Website
7. Restoration of Indigenous names of landmarks
8. Other expressions of historical acknowledgement

Note : This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. Heirs Property and Generational Land Loss | The American College of Trust and Estate Counsel. Accessed March 16, 2022. https://www.actec.org/diversity/heirs-property-generational-land-loss/
2. The Workers That Built America | The Nation. Accessed March 16, 2022. https://www.thenation.com/article/archive/black-working-class-history-joe-william-trotter-book-review/
3. The Transcontinental Railroad and the Asian-American Story | National Postal Museum. Accessed March 16, 2022. https://postalmuseum.si.edu/the-transcontinental-railroad-and-the-asian-american-story
4. National Apology | National Museum of Australia. Accessed March 16, 2022. https://www.nma.gov.au/defining-moments/resources/national-apology
5. The Civil Rights Implications of Eminent Domain Abuse A Briefing Before The United States Commission on Civil Rights Held in Washington, DC Briefing Report.
6. Slavery in Brazil | Wilson Center. Accessed March 30, 2022. https://www.wilsoncenter.org/blog-post/slavery-brazil
7. In Brazil the wounds of slavery will not heal | Americas | North and South American news impacting on Europe | DW | 13.05.2018. Accessed March 30, 2022. https://www.dw.com/en/in-brazil-the-wounds-of-slavery-will-not-heal/a-43754519
8. The Caribbean | Slavery and Remembrance. Accessed March 30, 2022. http://slaveryandremembrance.org/articles/article/?id=A0105
9. The Legacy of Slavery in the Caribbean and the Journey Towards Justice | United Nations. Accessed March 30, 2022. https://www.un.org/en/un-chronicle/legacy-slavery-caribbean-and-journey-towards-justice
10. A SUMMARY OF REPARATION AND REHABILITATION POLICY. Accessed March 16, 2022. https://www.justice.gov.za/trc/reparations/summary.htm
11. Who We Are - Truth and Conciliation. Accessed March 16, 2022. https://truthandconciliation.org/who-we-are/
12. Meng Foon: Why we need affirmative action for minority groups | Stuff.co.nz. Accessed March 16, 2022. https://www.stuff.co.nz/opinion/300438549/meng-foon-why-we-need-affirmative-action-for-minority-groups
13. Armenta BE, Whitbeck LB, Habecker PN. The Historical Loss Scale: Longitudinal Measurement Equivalence andProspective Links to Anxiety Among North American IndigenousAdolescents. Cultur Divers Ethnic Minor Psychol. 2016;22(1):1. doi:10.1037/CDP0000049
14. Yehuda R, Lehrner A. Intergenerational transmission of trauma effects: putative role of epigenetic mechanisms. World Psychiatry. 2018;17(3):243. doi:10.1002/WPS.20568
15. Came H, Baker M, McCreanor T. Addressing Structural Racism Through Constitutional Transformation and Decolonization: Insights for the New Zealand Health Sector. J Bioethical Inq 2021 181. 2021;18(1):59-70. doi:10.1007/S11673-020-10077-W
16. How to do a territorial acknowledgment | Folio. Accessed March 16, 2022. https://www.ualberta.ca/folio/2019/01/how-to-do-a-territorial-acknowledgment.html
17. Land & Labor Acknowledgement | Mid America Arts Alliance. Accessed March 16, 2022. https://www.maaa.org/land-labor-acknowledgement/
18. A Self-Assessment - Native Governance Center. Accessed March 16, 2022. https://nativegov.org/news/a-self-assessment/
19. What's wrong with land acknowledgments, and how to make them better | CBC News. Accessed March 16, 2022. https://www.cbc.ca/news/indigenous/land-acknowledgments-what-s-wrong-with-them-1.6217931
20. Koh E. The Healing of Historical Collective Trauma. Genocide Stud Prev An Int J. 2021;15(1):10. doi:<p>https:// doi.org/10.5038/1911-9933.15.1.1776</p

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

C21 ⊠ MULTISENSORY DESIGN | O (MAX : 4 PT)

Intent : Support neuro-inclusion through an informed planning process, multisensory design strategies and stakeholder education.

Summary : This WELL feature requires projects to facilitate a stakeholder charrette with a qualified neuro-inclusion professional, implement multisensory design strategies throughout the project and educate employees on neuro-inclusion.

Issue : Neurodiversity refers to the difference in neurocognitive profiles across an entire population.[4] It is estimated that 15-20% of the world's population exhibits some form of neurodivergence.[9] Human brains are unique and vary; therefore, the way people interact with the environment can differ for each person.[3,5] Neurocognition encompasses a wide range of profiles. This includes neurotypical, which describes someone fitting a majority neurological profile, as well as neurodivergent, which describes someone considered outside a majority or neurotypical neurological profile.[3,9,20] People who are neurodivergent have unique sensory processing needs and may experience the environment at heightened or lower intensity levels.[1,2,8] Companies actively hire people who are neurodiverse but few understand how to create supportive spaces.[3,6,20] Traditional design often overlooks the specific needs of people who are neurodivergent as spaces are usually designed for neurotypical users.[6,15] This leads to environments that are not supportive of people who are neurodivergent, which may hinder their ability to focus, cause anxiety and limit their participation.[6,10,13] Although research is limited, there is a growing body of knowledge that is informing neuro-inclusive design.

Solutions : Due to the complex and nuanced nature of creating multisensory design strategies, it is important for qualified neuro-inclusion professionals and people who are neurodivergent to be engaged throughout the integrated planning and design process.[2,9] Qualified professionals can help identify and implement evidence-based goals and solutions.[2] People who are neurodiverse can guide design decisions towards those that will be most important, impactful and supportive based on their lived experience.[9] Creating spaces for neuro-inclusion also requires the implementation of multisensory design strategies to address individual differences in sensory processing. High-stimulation design strategies support hypo-sensitive individuals who may experience understimulation, while low-stimulation design strategies support hyper-sensitive individuals who may experience overstimulation.[1,8,12] Individual control, access to nature, as well as acoustic and lighting elements are additional factors that support self-regulation and psychological safety for all individuals, regardless of how people process stimuli.[1,7,8,17] In addition, ensuring that multisensory design strategies are sequenced can help provide natural transitions and a balance of sensory spaces throughout.[1,11,12,13] Finally, stakeholder education can help communicate the benefits of neuro-inclusive design strategies and policies to all.[3,4,10]

PART 1 PLAN FOR NEURO-INCLUSION (MAX : 1 PT)

For All Spaces:

Facilitate a stakeholder charrette that meets the following requirements:[3,9]

a. Is hosted early in the WELL planning process (may be part of the stakeholder charrette listed in Feature C02 Part 1).

b. Involves a qualified neuro-inclusion professional.

c. Includes efforts to involve representatives from the following stakeholders, as applicable:

   1. Owners.
   2. Organizational representatives who identify as neurodivergent.
   3. Interior design professionals (e.g., interior designer, facilities planner, lighting specialist, acoustics specialist).
   4. Human resources.
   5. Facilities managers.
   6. Architects.
   7. Engineers.
   8. Contractors.

d. Accommodates participation from relevant stakeholders by addressing barriers (e.g., cultural norms or values, literacy levels, language, disabilities, work schedules, childcare) through timing, location, format and communication strategies.[9]

e. Defines goals for how the project will support neuro-inclusion through multisensory design strategies.

f. Identifies a list of credible sources (e.g., interviews, research studies, articles) that support how the identified neuro-inclusion goals may be addressed.

g. Recommends a set of multisensory design strategies to support neuro-inclusion throughout the project.

Note :

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 2 CREATE SPACES FOR NEURO-INCLUSION (MAX : 2 PT)

For All Spaces:

1: Neuro-inclusive Design

Note : Projects may only achieve this part if Part 1 is also achieved.

The following requirements are met:

a. At least five of the following multisensory design strategies are implemented:

   1. Adjustable environmental factors (e.g., screens, privacy panels, desks, chairs, lighting, temperature, acoustics) that allow people to control their sensory exposure are incorporated throughout.[6,15,18]
   2. Natural forms, patterns, lines, shapes and objects (e.g., biomorphic, organic, fractal) are incorporated

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

throughout.[5,17,15]

3. Environmental cues (e.g., visual, tactile, auditory, sensory maps) that indicate a shift in behavior or activity between spaces are incorporated throughout.[2,16,19]
4. Furniture that allows the body to stay in motion while using (e.g., rocking chair, balance boards).[15]
5. Movable furniture that can be relocated without causing noise disruption (e.g., placed on soft floor, includes furniture pads) is incorporated throughout.[6]
6. Enclosed areas that have interior windows providing clear lines of sight throughout the space are present.[6,13,15]
7. Walls that are curved or have rounded corners are present.[1,13]
8. Single-loaded corridors (i.e., doors to rooms are only located on one side only) are present.[1,13]
9. Personal storage for each regular occupant is available.[15]
10. At least two entrances to the building are available, one designed with low-stimulation design strategies and one designed with high-stimulation design strategies.

b. At least four of the following low-stimulation design strategies are implemented in at least two spaces:
   1. Environmental factors that support visual, auditory and physical privacy.[5,11,18]
   2. Areas of refuge.[1,11,19]
   3. Low-intensity colors and patterns.[1,5,13]
   4. Low-threshold textural experiences (e.g., materials that are smooth or predictable in typography, carpets with low pile).[1,11,18]
   5. Restorative elements (e.g., biophilic patterns, calming sounds, horizontal lines).[13,18,19]
   6. Use of intimate scale (e.g., low ceilings, tight spatial layout).[6,13,19]
   7. Symmetrical organization of spatial layout and design elements.[1,13]
c. At least four of the following high-stimulation design strategies are implemented in at least two spaces:
   1. Environmental factors that support visual, auditory and physical stimulation.[13,15,19]
   2. Active and energizing design elements (e.g., natural sounds, low music, accent lighting).[6,13,19]
   3. High-intensity colors and patterns.[6,13,19]
   4. High-threshold textural experiences (e.g., materials that are rough or unpredictable in typography, carpets with high pile). [6,13,19]
   5. Use of open scale (e.g., high ceilings, open spatial layout).[6,13,19]
   6. Asymmetrical organization of spatial layout and design elements.[1,13]
d. Low-stimulation and high-stimulation spaces are distributed according to the following:
   1. Interspersed throughout the project boundary.[1,13]
   2. Incorporated in both work spaces and non-work spaces.

2: Flexible Work Space Policy

The following requirement is met:

a. A flexible work space policy is in place that allows employees to work in different spaces within the project boundary and throughout the day based on their individual sensory needs.[6,10,19]

Note :

This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

PART 3 EDUCATE FOR NEURO-INCLUSION (MAX : 1 PT)

For All Spaces:

1: Neuro-inclusive Employee Communication

The project meets the following requirements:

a. Identifies and communicates the neuro-inclusive design strategies and related policies to employees through at least two of the following:
   1. Virtual tours, available on-demand.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

2. In-person tours, available upon request.
3. Employee handbook.
4. Signage throughout the project boundary.

2: Neurodiversity Education

The project offers educational programming that meets the following requirements:

a. Is provided by a qualified neuro-inclusion professional.
b. Is offered annually to all employees.
c. Is offered live, either in-person or virtually.
d. Covers the following topics:
    1. Overview of the conditions of people who are neurodivergent.
    2. Preferred terms, language and definitions used to describe people who are neurodivergent.
    3. Evidence-based strategies to support and accommodate neuro-inclusion.
    4. Benefits of neuro-inclusive workplaces.
    5. Evidence-based strategies for preventing, identifying and navigating observed or experienced discrimination toward people who are neurodiverse.

Note :
This feature is a beta strategy and has an additional documentation requirement (beta feature feedback form). The feedback form supports IWBI in developing new features that are effective and applicable to projects around the world.

REFERENCES

1. Cassidy, M. K. (2018). Neurodiversity in the Workplace: Architecture for Autism [Master's thesis, University of Cincinnati]. OhioLINK Electronic Theses and Dissertations Center. Reference
2. Cieslik, Emma. "Accessibility and Exhibit Safety: The Importance of Sensory Maps." Collections (2024): 15501906241232310.
3. Doyle, Nancy. "Neurodiversity at work: a biopsychosocial model and the impact on working adults." British medical bulletin 135, no. 1 (2020): 108-125.
4. Hedley, Darren, Sarah Cassidy, Chris Templin, Susan Hayward, Erin Bulluss, Jac den Houting, Kairi Kolves et al. "Recommendations from the 2021 Australasian Society for Autism Research "Health, Wellbeing and Suicide Prevention in Autism" Conference and Roundtable." (2022).
5. Hewitt, Jean. "Neurodiversity & the Built Environment - PAS 6463:2022." BSI, 2022. Downloaded from: https://www.bsigroup.com/en-GB/insights-and-media/insights/brochures/pas-6463-design-for-the-mind-neurodiversity-and-the-built-environment/. Accessed July 7, 2024.
6. HOK, Designing a neurodiverse workplace. (2019). Downloaded from https://www.hok.com/ideas/publications/hok-designing-a-neurodiverse-workplace/. Accessed October 26, 2021.
7. International Association of Accessibility Professionals. "Certified Professional in Accessible Built Environments (CPABE)." International Association of Accessibility Professionals. Downloaded from: https://www.accessibilityassociation.org/s/certified-professional-environments. Accessed July 7, 2024.
8. Kwon, J., Linihan, S., Iedema, A., Schmidt, A., Luo, C., & Marrufo, K. (2023). How interior design responds to neurodiversity: implementing wearable technologies in neurodesign processes. Frontiers in Built Environment, 9, 1211519.
9. Le Cunff, A. L., Logan, P. E., Ford, R., Martis, B. L., Mousset, I., Sekibo, J., ... & Giampietro, V. (2023). Co-design for participatory neurodiversity research: collaborating with a community advisory board to design a research study. Journal of Participatory Research Methods, 4(1).
10. LeFevre-Levy, Rose, Arturia Melson-Silimon, Rebecca Harmata, Anna L. Hulett, and Nathan T. Carter. "Neurodiversity in the workplace: Considering neuroatypicality as a form of diversity." Industrial and Organizational Psychology 16, no. 1 (2023): 1-19.
11. Mostafa, Magda. "Architecture for autism: Built environment performance in accordance to the autism ASPECTSS design index." In Autism 360°, pp. 479-500. Academic Press, 2020.
12. Mostafa, Magda. "The autism friendly university design guide." Dublin City University, Dublin (2021).

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

13. Mostafa, Magda, Marlene Sotelo, Toby Honsberger, Christine Honsberger, Erin Brooker Lozott, and Nate Shanok. "The impact of ASPECTSS-based design intervention in autism school design: a case study." Archnet-IJAR: International Journal of Architectural Research 18, no. 2 (2024): 318-339.
14. Paron, A. J. "Design for all needs design empathy." Journal of Interior Design 45, no. 4 (2020): 3-9.
15. Paron-Wildes, A. J. Interior Design for Autism from Adulthood to Geriatrics. John Wiley & Sons, 2013.
16. Patel, Tina, Juliann Dorff, and Allison Baker. "Development of special needs classroom prototypes to respond to the sensory needs of students with exceptionalities." Archnet-IJAR: International Journal of Architectural Research 16, no. 2 (2022): 339-358.
17. Rita Trombin. Working with fractals: A resource for practitioners of biophilic design. New York: Terrapin Bright Green, 31 December 2020.
18. Tarkett, Sensory Processing Neurodiversity and Workplace Design (2022). Downloaded from: Reference. Accessed February 1, 2023.
19. Weber, Clara, Beate Krieger, Eunji Häne, Joanna Yarker, and Almuth McDowall. "Physical workplace adjustments to support neurodivergent workers: A systematic review." Applied Psychology 73, no. 3 (2024): 910-962.
20. HOK, Designing neuroinclusive laboratory environments. (2024). Downloaded from https://www.hok.com/ideas/publications/designing-neuroinclusive-laboratory-environments/

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

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).

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

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
Healthy Behaviors:	Mode of transportation to and from work and distance or time traveled
	Hydration
	Sleep satisfaction, quality and/or quantity
	Physical activity
	Alcohol consumption
	Healthy eating
	Ability to take restorative breaks
	Smoking habits
Enhanced Health and Well-being:	Sick building syndrome
	Mental health
	Social, cultural or economic well-being
	Musculoskeletal issues (e.g., back, neck pain)
	Health literacy
Performance and Resilience:	Assessment of individual work style, patterns, processes, space utilization and ability to focus or collaborate
	Workplace performance
	Engagement
	Workload, stress, burnout and/or employee resilience
	Creative thinking
Policies and Culture:	Safety and security, including for various population groups (e.g., cultural, ethnic, gender, ability, age)
	Emergency preparedness (e.g., pandemic, fire, natural disaster)
	Workplace wellness programs and perceived effectiveness
	Leadership investment in employee health and perceived effectiveness
	Workforce engagement and belonging programs and perceived effectiveness
Other:	Comparison to previous space
	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)

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

APPENDIX C3:

The following supplies must be included in first aid kits per the requirements of Feature C14 Emergency Resources.[1]

Bandages

- Adhesive bandage
- Adhesive tape
- Burn dressing (gel soaked)
- CPR breathing barrier
- Eye covering (with means of attachment)
- Roller bandage
- Sterile pad
- Trauma pad
- Triangular bandage (e.g., for a sling)

Lotions, oils and other fluids

- Antibiotic application
- Antiseptic
- Burn treatment
- Eye wash
- Hand sanitizer

First aid tools

- Cold pack
- First aid guide
- Medical exam gloves
- Scissors

References:

1. American National Standards Institute (ANSI), International Safety Equipment Association (ISEA). *First Aid Regulations.*; 2015.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

INNOVATION

Innovation features pave the way for projects to develop unique strategies for creating healthier environments.

Innovation features address a novel concept or strategy not already included in WELL features.

Projects should use Feature I01: Innovate WELL to submit innovation proposals. This feature provides guidelines on the requirements that must be met in order for an innovation proposal to be considered for approval. Other Innovation features represent strategies pre-approved by IWBI.

Projects may receive up to 10 points in Innovation.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

I01 INNOVATE WELL | O (MAX : 10 PT)

Intent : To promote the continuous evolution of WELL, by encouraging projects to propose a new intervention that addresses health and well-being in a novel way.

Summary : As the scientific understanding of health continues to evolve, so too does the ability to address the complex issue of promoting health and well-being through building design and operations. WELL Innovation features embrace novel approaches to promoting the creation of healthier spaces that go above and beyond features in WELL v2.

PART 1 PROPOSE INNOVATION (MAX : 1 PT)

For All Spaces:

The project implements a health and well-being strategy that meets the following requirements:

a. Positively impacts project occupants by supporting health and well-being in a novel way that is not covered in WELL v2.
b. Substantiated by existing scientific, medical and/or industry research.
c. Consistent with applicable laws and regulations and leading practices in building design and operations.

PART 2 PROPOSE INNOVATION (MAX : 1 PT)

For All Spaces:

The project implements a health and well-being strategy that meets the following requirements:

a. Positively impacts project occupants by supporting health and well-being in a novel way that is not covered in WELL v2.
b. Substantiated by existing scientific, medical and/or industry research.
c. Consistent with applicable laws and regulations and leading practices in building design and operations.

PART 3 PROPOSE INNOVATION (MAX : 1 PT)

For All Spaces:

The project implements a health and well-being strategy that meets the following requirements:

a. Positively impacts project occupants by supporting health and well-being in a novel way that is not covered in WELL v2.
b. Substantiated by existing scientific, medical and/or industry research.
c. Consistent with applicable laws and regulations and leading practices in building design and operations.

PART 4 PROPOSE INNOVATION (MAX : 1 PT)

For All Spaces:

The project implements a health and well-being strategy that meets the following requirements:

a. Positively impacts project occupants by supporting health and well-being in a novel way that is not covered in WELL v2.
b. Substantiated by existing scientific, medical and/or industry research.
c. Consistent with applicable laws and regulations and leading practices in building design and operations.

PART 5 PROPOSE INNOVATION (MAX : 1 PT)

For All Spaces:

The project implements a health and well-being strategy that meets the following requirements:

a. Positively impacts project occupants by supporting health and well-being in a novel way that is not covered in WELL v2.
b. Substantiated by existing scientific, medical and/or industry research.
c. Consistent with applicable laws and regulations and leading practices in building design and operations.

PART 6 PROPOSE INNOVATION (MAX : 1 PT)

For All Spaces:

The project implements a health and well-being strategy that meets the following requirements:

a. Positively impacts project occupants by supporting health and well-being in a novel way that is not covered in WELL v2.
b. Substantiated by existing scientific, medical and/or industry research.
c. Consistent with applicable laws and regulations and leading practices in building design and operations.

PART 7 PROPOSE INNOVATION (MAX : 1 PT)

For All Spaces:

The project implements a health and well-being strategy that meets the following requirements:

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

a. Positively impacts project occupants by supporting health and well-being in a novel way that is not covered in WELL v2.
b. Substantiated by existing scientific, medical and/or industry research.
c. Consistent with applicable laws and regulations and leading practices in building design and operations.

PART 8 PROPOSE INNOVATION (MAX : 1 PT)

For All Spaces:

The project implements a health and well-being strategy that meets the following requirements:

a. Positively impacts project occupants by supporting health and well-being in a novel way that is not covered in WELL v2.
b. Substantiated by existing scientific, medical and/or industry research.
c. Consistent with applicable laws and regulations and leading practices in building design and operations.

PART 9 PROPOSE INNOVATION (MAX : 1 PT)

For All Spaces:

The project implements a health and well-being strategy that meets the following requirements:

a. Positively impacts project occupants by supporting health and well-being in a novel way that is not covered in WELL v2.
b. Substantiated by existing scientific, medical and/or industry research.
c. Consistent with applicable laws and regulations and leading practices in building design and operations.

PART 10 PROPOSE INNOVATION (MAX : 1 PT)

For All Spaces:

The project implements a health and well-being strategy that meets the following requirements:

a. Positively impacts project occupants by supporting health and well-being in a novel way that is not covered in WELL v2.
b. Substantiated by existing scientific, medical and/or industry research.
c. Consistent with applicable laws and regulations and leading practices in building design and operations.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

I02 WELL ACCREDITED PROFESSIONAL (WELL AP) | O (MAX : 1 PT)

Intent : To recognize projects that engage a WELL AP to support the WELL certification process.

Summary : The WELL Accredited Professional (WELL AP) credential denotes expertise in WELL and a commitment to advancing human health and well-being in buildings and communities. The presence of a WELL AP on a project team can benefit project planning and achievement efforts by streamlining the WELL application and certification process.

PART 1 ACHIEVE WELL AP (MAX : 1 PT)

For All Spaces:

At least one member of the project team:

a. Has achieved the WELL Accredited Professional credential.

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

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

I03 EXPERIENCE WELL CERTIFICATION | O (MAX : 1 PT)

Intent : To promote on-going education about WELL, by encouraging projects to offer building tours and educational components highlighting WELL features pursued for certification.

Summary : Increasing awareness about health and well-being solutions in buildings is a central part of WELL's mission. Education on WELL is best showcased by inviting individuals into the physical project space and highlighting the WELL features pursued. To receive credit for this Innovation, projects must provide tours of the space, as well as implement education strategies that enable building occupants and visitors to learn more about the impact of built spaces on their health and well-being.

PART 1 OFFER WELL EDUCATIONAL TOURS (MAX : 1 PT)

For All Spaces:

The project provides free, public tours of the WELL Certified space. Tours are offered on a pre-determined schedule or upon request and meet the following requirements:

a. Offered at least six times per year.

b. Include at least one destination per WELL concept.

c. Advertised through at least one publicly accessible channel (e.g., project website, signage, social media).

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

I04 GATEWAYS TO WELL-BEING | O (MAX : 1 PT)

Intent : To recognize projects that have taken meaningful steps toward deeper commitments to health and well-being.

Summary : Organizations build a culture of health in different ways. For some, it starts at the top, with a commitment from leadership to enact change. For others, it is borne out of grassroots initiatives, gaining momentum from the ground up. While every organization travels a different path, there are a variety of third-party programs and initiatives on offer to support an organization's journey. IWBI awards an Innovation point to projects that participate in wellness programs that act as gateways to deeper commitments.

PART 1 COMPLETE HEALTH AND WELL-BEING PROGRAMS (MAX : 1 PT)

For All Spaces:

Note : Projects can document participation in multiple programs that collectively address three or more WELL Concepts but may only receive one point under this Innovation.

The following requirement is met:

a. Within the last three years, the project has completed an independent health and well-being program, or an initiative approved by IWBI and listed on IWBI's website (Reference).

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

I05 GREEN BUILDING RATING SYSTEMS | O (MAX : 5 PT)

Intent : To recognize projects that have achieved certification under leading green building rating systems.

Summary : WELL aligns with leading green building rating systems and recognizes projects that balance a commitment to environmental sustainability with a commitment to human health. Policies that reduce the environmental impact of buildings contribute to the advancement of human health at the building and community scale. The environment itself can act as a mechanism to promote and reinforce health by providing fresh air, clean water, affordable and accessible food and green spaces for physical activity and social connection. By balancing sustainability and human health considerations, both people and planet can thrive.

PART 1 ACHIEVE GREEN BUILDING CERTIFICATION (MAX : 5 PT)

For All Spaces:

The following requirement is met:

a. The project is currently certified in a green building rating system approved by IWBI and listed on IWBI's website (Reference).

Note :

Projects receive the full five points in Innovation for pursuing a green building rating system. Projects cannot receive more than five points for pursuing additional green building rating programs.

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

I06 CARBON DISCLOSURE AND REDUCTION | O (MAX : 10 PT)

Intent : Reduce emissions from greenhouse gases to slow the global rise in temperature.

Summary : This WELL feature requires organizations to assess and disclose their carbon emissions, set emission reduction targets, and progress toward carbon neutrality. Climate change as a result of human-caused changes to the environment represents the most existential threat to public health in the next half-century.[1] Without modifications to the world's energy and agricultural systems, the planet is on track to warm by 3 to 5 degrees by the end of the century.[2] This change will increase the frequency of extreme weather events, inundate coastal communities by rising sea levels, and create conditions more conducive to growth of destructive pest organisms, among other perils.[1] The 2015 Paris Agreement is a legally binding international treaty involving nearly 200 nations created in an attempt to keep the global rise in temperatures to less than 2 C above pre-industrial levels.[3] Although some efforts to reduce emissions do come at higher initial cost than "business as usual", the benefits are far higher.[4] In fact, the co-benefits alone of achieving the target (cleaner air as a result of a shift away from fossil fuel) substantially outweighs the cost of change.[5] In addition to national the goals, many organizations have made their own commitments to change. Many of these are modest,[6] but others – such as those made in partnership with the Science Based Targets initiative (SBTi) – have been evaluated to align with the Paris Agreement goals. [7] These goals are often categorized by their scope, where Scope 1 entails all emissions generated on-site, Scope 2 is all carbon emitted as a result of generating the energy used by the reporting entity,[8] and Scope 3 includes all upstream emissions (from the supply chain), downstream emissions (from use of products), and other indirect emissions (e.g., employee commutes, business travel).[9]

PART 1 ASSESS CARBON EMISSIONS (MAX : 2 PT)

For All Spaces:

A carbon emissions assessment meets the following requirements:

a. Is conducted for the entire organization associated with the property owner, builder, developer or management company.

b. Is undertaken in accordance with one of the following:

   1. GHG Corporate Standard,
   2. ISO14064-1:2018, or
   3. Another program based on one of the above.

c. Addresses scopes of emissions according to one of the tiers in the table below.

Scope	Points
All emissions in Scope 1 and Scope 2.	1
All of the above, plus all emissions from at least the top three categories of Scope 3 (include a justification for selecting these categories).	2

d. Is reviewed and audited at least at the level of a Limited Assurance engagement (e.g., according to ISAE 3410 or AA1000AS).

e. Is updated annually.

f. Is prominently and publicly available (e.g., on company website, in annual report).

PART 2 SET CARBON REDUCTION GOALS (MAX : 3 PT)

Note :

To earn this part, projects must also achieve Part 1 at Tier 2.

For All Spaces:

The property owner, builder, developer or management organization meets the following requirements:

a. Sets a carbon reduction goal that is prominently and publicly available (e.g., on company website, in annual report).

b. Meets the requirements in one of the tiers in the table below:

Tier	Carbon Reduction Goals	Point Value
1	Has submitted a commitment letter regarding their carbon reduction goal and is recognized as "Committed" by the Science Based Targets initiative.	1

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

2	Selects a base year within the previous 5 years and the carbon reduction goals meet all of the following: - Includes all emissions from Scopes 1 and 2, plus at least the top three categories of Scope 3. - Based on absolute emissions (i.e., not emissions intensity). - Includes targets of a year-over-year reduction of at least 3% for each of the next 10 years, or until carbon neutrality is reached.	2
3	Has an approved science-based carbon reduction target and is recognized as "Targets Set" by the Science Based Targets initiative.	3

PART 3 MEET CARBON REDUCTION GOALS (MAX : 3 PT)

Note :

To earn this part, projects must also achieve Part 1 at Tier 2.

For All Spaces:

The property owner, builder, developer or management organization meets the following:

a. Has set a carbon reduction goal at least one reporting year prior to pursuing this part. (This may have occurred prior to participating in WELL).

b. Has met that carbon reduction goal, as calculated by one of the following:

   1. Emissions reduced between the most recent reporting year and the previous reporting year.
   2. Average emissions reduced year-over-year for multiple consecutive years (including an assessment undertaken not more than one year ago).

PART 4 ATTAIN CARBON NEUTRALITY (MAX : 2 PT)

Note :

To earn this part, projects must also achieve Part 3.

For All Spaces:

The property owner, builder, developer or management organization meets one of the following requirements in the current reporting year:

a. Is certified as carbon neutral by a scheme that follows PAS 2060.

b. Has purchased carbon credits and/or offsets from one of the following schemes to offset all emissions:

   1. Verra/VCS.
   2. Gold Standard.
   3. ACR.

REFERENCES

1. https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(18)30056-1/fulltext

2. https://www.nature.com/articles/d41586-020-00177-3

3. https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6985261/

5. https://pubmed.ncbi.nlm.nih.gov/29615227/

6. https://www.bloomberg.com/graphics/2020-company-emissions-pledges/

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.

7. https://sciencebasedtargets.org/how-it-works
8. https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance
9. https://www.epa.gov/climateleadership/scope-3-inventory-guidance
10. https://sciencebasedtargets.org/step-by-step-process

© Copyright 2020 International WELL Building Institute, pbc. All Rights Reserved.