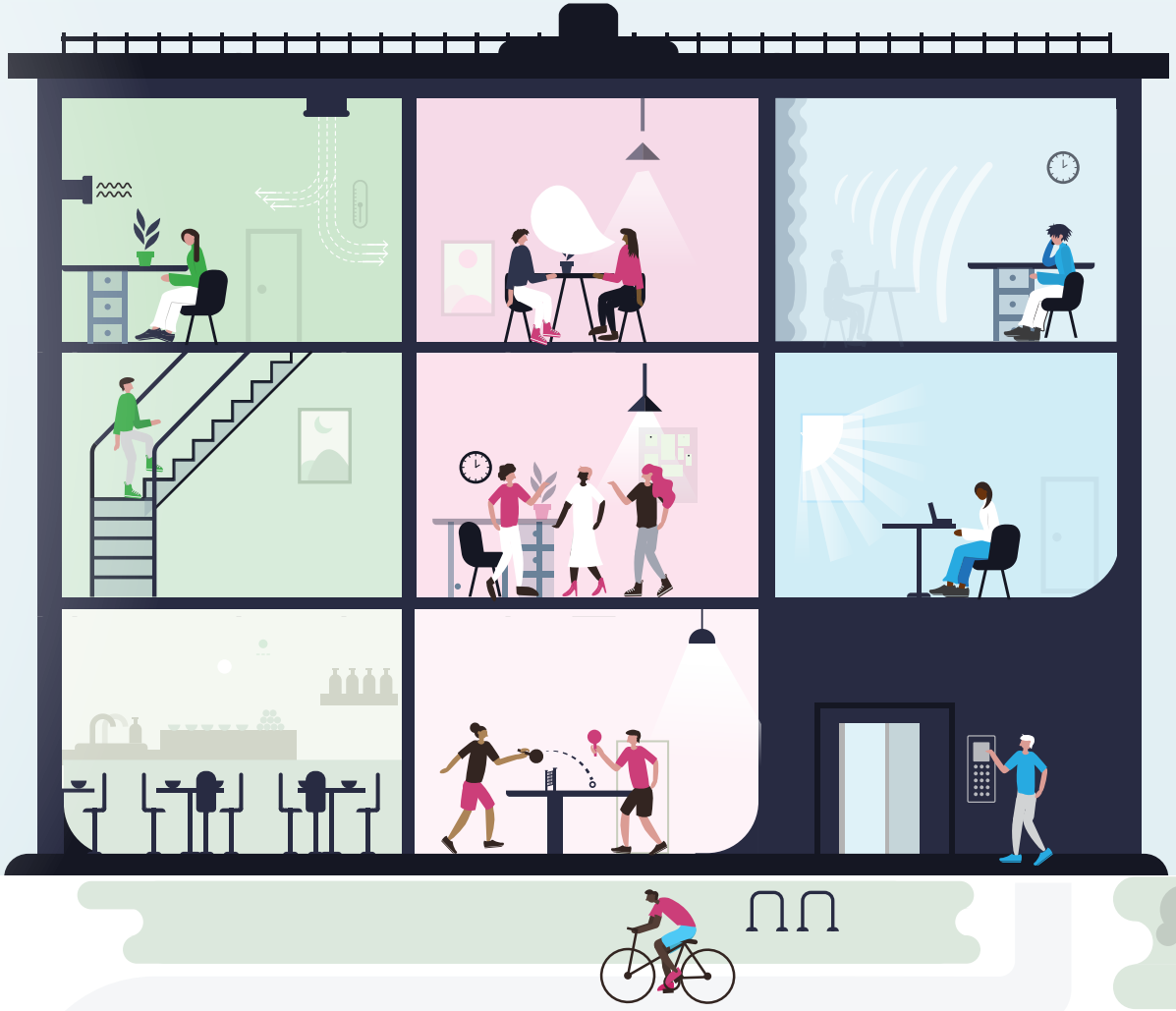
Healthy Buildings Guide

How focusing on health helps deliver sustainable developments



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Foreword

Thanks to the array of research undertaken in the 'healthy buildings' space, the role buildings and the built environment play in relation to human health and well-being has never been more evident or valuable.

Buildings can have a profound impact on the human body, and can interfere with our ingrained human cycles, such as our sleep cycles. The COVID-19 pandemic also shone a light on why health and wellbeing is of great importance across the world.

Factors influencing our health and well-being are broad, ranging from local air and water quality to proper nourishment and encouraging movement. Some are dependent on our own personal preferences, whilst others are based on our human responses to stimuli.

The true benefits of 'healthy buildings' are only just beginning to be realised and quantified, including improved lease terms, increased value, increased employee productivity, reduced absenteeism and staff/tenant turnover.

At Envision, we believe that all buildings, regardless of timescales or budget, can be designed to benefit the health and wellbeing of their occupants. We have developed this guide to encourage stakeholders to recognise the health and wellbeing issues facing the industry, and implement design solutions that can make a positive change. We also want to show that healthy buildings has an important role to play in the delivery of a wider ESG strategy.

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Designing Healthy Buildings

Healthy Buildings can be defined through three pillars: Physical Health, Social Health, and Mental and Emotional Health.

These three pillars and their intertwined nature should be explored holistically when designing healthy buildings, with the aim of designing and delivering more people-centred and health-enhancing places.

A Air quality & ventilation

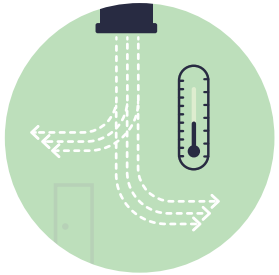
Issues:

Poor indoor air quality has been historically overlooked, with a predominant focus on outdoor air pollution. This oversight poses significant health risks, as indoor pollutants like $PM_{2.5}$, NO_2, SO_2, CO_2, allergens, and VOCs contribute to potential health problems. VOCs are a major concern, with a significant portion of emissions occurring within indoor environments. Measuring and predicting indoor air quality is a challenging endeavour due to uncertainties in identifying pollution sources.

Design Solutions:

- **Prioritise Indoor Air Quality:** Shift attention towards improving indoor air quality to address the growing awareness of its impact on health.
- **Smoke-free Environment:** Ensure smoking (including e-cigarettes) is prohibited from the building, building entrances, openable windows and building air intakes.
- **Pollution Source Control:** Implement measures to control emissions from building materials, furniture, cleaning products, and combustion appliances.
- **Low VOC Materials:** Specify materials with low VOC content in construction and interior design to reduce pollutant levels.
- **Adequate Ventilation:** Ensure effective ventilation systems to prevent the accumulation of indoor pollutants in the human body.
- **Air Quality Monitoring and Awareness:** Ongoing measurement and data on air quality can educate and empower occupants about their environmental quality which in turn can encourage opportunities to reduce indoor pollution levels.

B Thermal comfort



Issues:

Thermal comfort poses several challenges, including a lack of awareness about its significance, the complexity of managing factors like air temperature and humidity, and the presence of unchangeable factors like location and orientation that influence comfort. Poor thermal comfort can lead to health problems and reduced productivity among occupants.

Design Solutions:

- **Advanced HVAC Systems:** Implement advanced heating, ventilation, and air conditioning (HVAC) systems that allow precise control of air temperature, humidity, and air movement.
- **Thermal Zoning:** Use individual zoning controls within a building to cater to different comfort preferences and optimise conditions for occupants.
- **Regular Monitoring:** Continuously monitor thermal conditions using sensors and gather occupant feedback through surveys to fine-tune comfort parameters.
- **Extreme Event Preparedness:** Develop strategies for managing thermal comfort during extreme events like heatwaves to minimise discomfort and health risks for occupants.
- **Individual Thermal Comfort:** Provide personal heating and cooling options (such as desk fans and blankets) so individuals can control their own temperature. Also allow for flexible dress codes.
- **Awareness and Education:** Promote awareness and educate occupants and building managers about the importance of thermal comfort and its impact on well-being and productivity.

C Active travel and movement

Issues:

As human lifestyles increasingly become sedentary, physical inactivity has become a significant concern. In the UK, it is associated with 1 in 6 deaths and incurs an estimated cost of £7.4 billion annually. The importance of promoting active lifestyles cannot be overstated, given its potential to reduce the risk of conditions like dementia, diabetes, and cardiovascular disease, while also enhancing mental health.

Design Solutions:

- **Infrastructure and Accessibility:** Develop infrastructure that supports active commuting, such as bike lanes and pedestrian-friendly routes.
- **Design for Active Movement:** Focus movement around the building, particularly between floors, on active movement, e.g. staircase having central focal point and motivational signage.
- **Active Furnishings:** Provide active workstations, such as sit-stand or treadmill desks.
- **Employer Initiatives:** Implement workplace programs that promote active travel among employees to enhance productivity, morale, and reduce absenteeism.
- **Incentives:** Provide incentives for employees to choose active travel options, such as biking or walking, for their daily commute.

D Non-toxic materials and chemicals

Issues:

Harmful chemicals emitted from construction materials, such as asbestos, lead-based paints, and synthetic carpets, pose severe health risks, including respiratory diseases and neurological issues. Volatile organic compounds (VOCs) found in paints, adhesives, and finishes can lead to "Sick Building Syndrome," causing symptoms like headaches and respiratory irritation. Lead exposure, even at low levels, can result in developmental delays in children and cardiovascular problems in adults. Formaldehyde, present in various building materials, is classified as a Group 1 carcinogen, with no safe level of exposure.

Design Solutions:

- **Use Non-Toxic Materials:** Prioritise non-toxic materials, including low-VOC paints, adhesives, and finishes.
- **Avoid Hazardous Chemicals:** Steer clear of materials like synthetic carpets emitting harmful off-gassing.
- **Reduce Formaldehyde Use:** Minimise the use of materials and furnishings containing formaldehyde.
- **Cleaning Practices:** Plan for cleaning operations by providing cleaning products that contain less hazardous ingredients, providing appropriate ventilation and implementing a cleaning policy that increases the overall efficiency of the process to reduce exposure to products.

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A Healthy lifestyles

Issues:

Nutrition and health are greatly interlinked. Many adults do not consume the recommended fruit and vegetables targets each day and have low nutrient diets. Poor diets are a large contributor to non-communicable diseases and a high-risk factor in a number of chronic diseases. The design of a building as well as the provision of nutrients in a development can encourage the healthy lifestyle of occupants, e.g. the design and location of food stations and water provision.

Design Solutions:

- **Access:** Provision of free fruit and vegetables and easily accessible water points situated at regular locations.
- **Water Quality:** Incorporate water infiltration systems to enhance the quality of the water provided.
- **Food Preparation:** Providing areas where food can be stored and prepared safely.
- **Portion Control:** Provision of correctly sized plates and bowls to encourage healthy decisions.
- **Food Choices:** Ensuring caterers offer fruit and non-fried vegetable offerings and the physical layout of food encourages the selection of healthy alternatives, such as being located at eye level or included as default options throughout the menu.
- **Nutrition Education:** Nutrition education materials are provided, such as cooking demonstrations, dietary education sessions or gardening / planting workshops.

B Social interaction

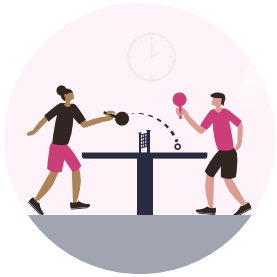
Issues:

Buildings are moving away from being the classic quiet office spaces. Today buildings are used as places to meet, discuss and collaborate. Buildings can be designed in ways to encourage collaboration and social interaction, improving the sense of place and belonging.

Design Solutions:

- **Acoustic Planning:** Designing the building for areas of 'Loud and mixed' collaboration, separated from quite work.
- **Alternative Spaces:** Provision of social break out / shared spaces for occupants away from their desks.
- **Mindful Eating:** Separate spaces designed for eating mindfully away from a desk or focused space.
- **External Space:** Outdoor break out space including seating spaces, which is non-smoking and encourages use (i.e. not located in a noisy area).
- **Recreational Play Spaces:** Consider including space and equipment for recreational and physical activities e.g. yoga mats or pool table.

C Sense of community



Issues:

A strong sense of community within a built environment significantly enhances occupants' health and wellbeing. By fostering social connections, it alleviates stress, anxiety, and depression, while leading to happiness and purpose. This communal support network mitigates loneliness, and during challenging times, neighbours provide practical and emotional aid. A positive work community encourages healthy behaviours, such as taking breaks together or participating in wellness programs, thus contributing to employees' physical wellbeing.

Design Solutions:

- **Break Out Spaces:** Provision of break out spaces with seating to encourage connection.
- **Accessibility:** Implement best practice universal design which accommodates a range of disabilities, covering physical access, wayfinding, technology and safety.
- **Community Programmes:** Encourage volunteering and community engagement.
- **Occupant Feedback:** Conduct occupant surveys to help understand and evaluate the effectiveness of existing operations, with the aim of identifying opportunities to create healthier environments.
- **Leisure Programmes:** Provision of craft or fitness classes to encourage non-work community related activities.

D Staff welfare & support

Issues:

Mental health is determined by a range of factors including environmental, socioeconomic and biological considerations. Working conditions, stress, lifestyle and healthy habits all impact mental health. Supporting staff, not only when they are at work, but also outside of the workplace can increase their satisfaction, mental health, and ultimately help attract and retain talent.

Design Solutions:

- **Stress Management:** Producing stress management plans and providing expert led training to staff about identifying the signs of stress and coping mechanisms available.
- **Health Services and Benefits:** Providing subsidised access to health services, whilst also offering sick leave and providing relevant immunisation programmes, such as the Flu vaccine.
- **Childcare Support:** Providing paid parental leave and flexible working policies.
- **Responsible Labour:** Consideration of cleaning, catering, security and maintenance services to ensure appropriate labour practices and payments.

A Exposure to light

Issues:

Exposure to light (both natural and artificial) is critical in supporting a person's circadian rhythm – a natural, 24-hour cycle that forms part of the internal body clock. The circadian rhythm ensures a number of vital functions and processes within the body take place at appropriate times – from digestive protein production to regulating levels of alertness or sleepiness. Daylighting in buildings is largely determined by locational and form factors, with high-quality design helping to maximise lighting levels. In general, the more detailed or intensive a specific task is, the more lighting will be required, with areas such as corridors and stores requiring less light. Buildings with ample natural light experience a 15% increase in occupant productivity.

Design Solutions:

- **Circadian Lighting:** Implement circadian lighting design. Light brightness levels, duration and the timing of exposure should be considered.
- **Daylighting:** Integrate daylight into indoor environments so it assists with visual task, and doesn't conflict with electric lighting. This should be coupled with glare control strategies, such as integrating occupant controlled shading on windows.
- **Occupant Profiles:** Consideration of the age of users, tasks performed and existing physical features in the space should be considered and are integral to creating productive spaces.

B Acoustic comfort

Issues:

Noise, consisting of "any sound that is undesired or interferes with one's hearing of something", may be less obviously disruptive to human health than thermal conditions, but can significantly impact everyday activities, disrupting work, conversations and even sleep. Noise can come from outdoor or internal sources, from construction and trains to office equipment and machinery. Impacts range from mild (irritability, distraction and decreased concentration) to severe (higher stress levels, sleep disturbances and even hearing loss). Adequate acoustic design is particularly important in office spaces, where many conversations and meetings can occur within small (often open plan) spaces.

Design Solutions:

- **Acoustic Plan:** Identify sources of noise (loud, quiet or mixed) and plan so that the impact of location on implement measures to mitigate it, such as sound barriers, appropriate location planning and sound reducing surfaces.
- **Noise Levels:** Achieve desired ambient noise levels and reverberation times, through specification of sound absorbing finishing materials, potential sound insulation using wall panels, and the possibility of ensuring zoning of areas or offering smaller private sound-proof work areas.
- **Artificial Noise:** Create artificial sounds which mask speech and distractions between occupied spaces.

C Nature and restorative spaces

Issues:

It is now well-known that humans, having evolved with nature (albeit less present in our everyday lives in recent years), have an intrinsic affinity to nature and natural elements. Benefits of nature-focused design include healthier indoor environments, leading to improvements in mood, creativity and productivity at the individual level – which, over time, can also lead to improved air quality and reduced number of sick days taken per employee at the organisational level. Biophilic design, which integrates nature into indoor spaces, has been associated with a 15% increase in overall well-being among occupants.

Design Solutions:

- **Outdoor Space:** Provision of outdoor break out space, which has appropriate seating, is non-smoking and is located away from sources of noise (i.e. car parks, busy roads etc).
- **Natural Materials:** Inclusion of natural materials in the design, such as natural patterns, shapes, colours, images or sounds.
- **Access to Nature:** Integration of nature and natural elements such as green and blue spaces and indoor planting.
- **Views Out:** Inclusion of views or images of nature that allow occupants to refocus their eyes.

D Safety and security

Issues:

Buildings are a critical component of us feeling safe – without this, our "fight or flight" response kicks in, raising adrenaline and cortisol levels in the bloodstream, leading to symptoms such as high blood pressure and a raised heart rate. If this happens over a prolonged period of time, our immune systems can be impacted, potentially increasing the risk of chronic diseases such as cardio-vascular disease (as well as the general risk of disease). It's important to note that even the anticipation of a potential threat can be harmful to us on a physical level.

Design Solutions:

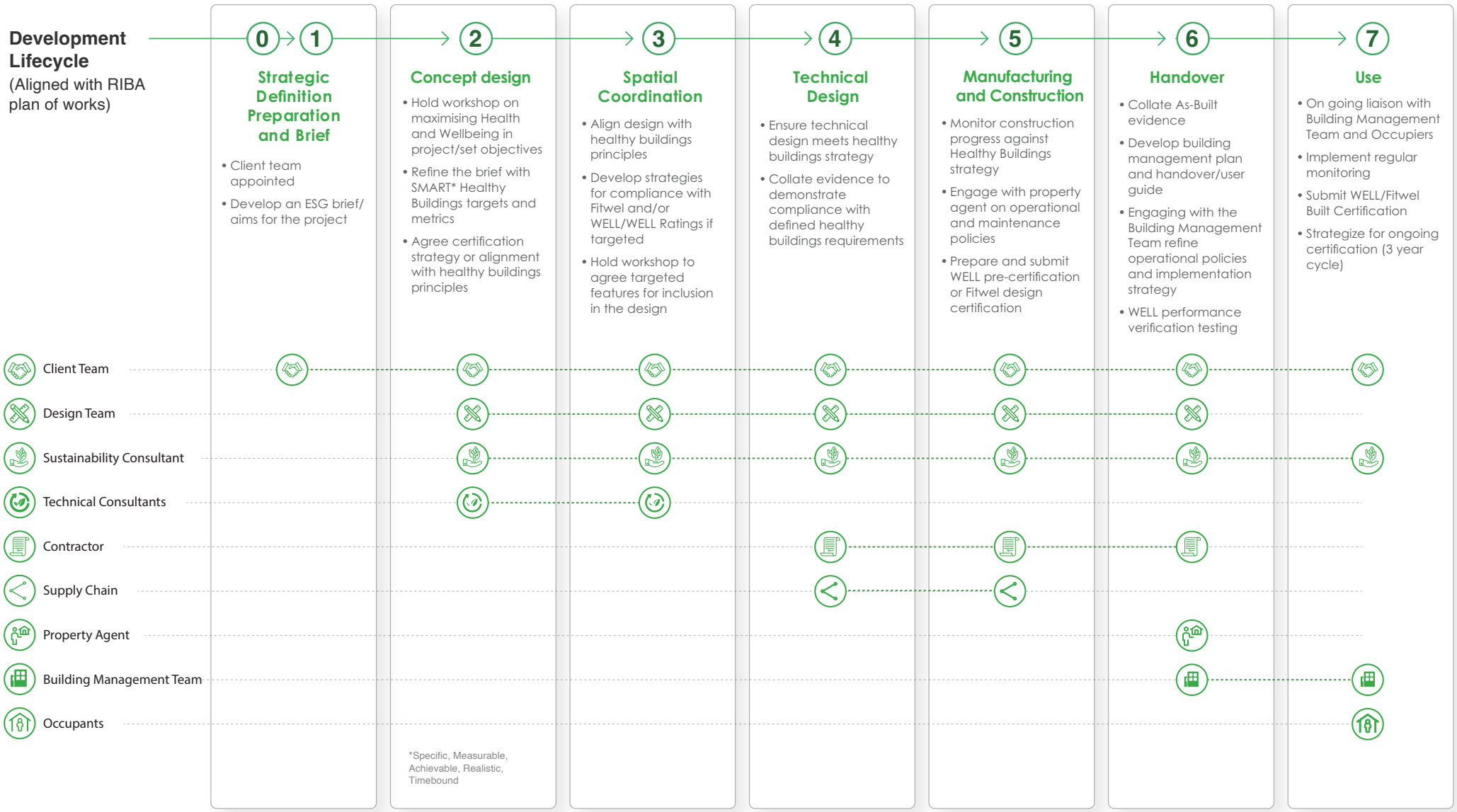
- **Specialist Advice:** Engage with a security consultant to provide recommendations specific to the building type and needs.
- **Emergency Resilience:** Prepare an emergency preparedness plan and circulate with occupants.
- **Remote Work Readiness:** Establish organisational remote work readiness to enable a smooth transition to remote working if required.
- **Business Continuity:** Implement a business contingency plan.

Healthy Building Accreditations

fitwel®	WELL™	WELL™ RATINGS
Launched in 2017, FitWel follows a balanced scorecard approach to award ratings as 1, 2 or 3 Stars	**Launched in 2014, WELL Assessments are based on a achieving a specific set of pre-conditions plus optimisation points to achieve a Bronze, Silver, Gold, Platinum rating**	**Launched in 2020, WELL ratings are a sub set of an overall WELL Assessment, following a balanced scorecard approach to the ratings (only pass or fail)**
Credits are split into 12 sections with 63 criteria	Credits are split into 11 concepts with 200+ features	- Performance rating – 37 features - Equity rating – 49 features - Health-safety Rating – 39 features
Design stage and as built assessments, based on documentary evidence and supporting photographs	Design stage and as built assessments, based on documentary evidence, photographs and onsite performance testing (completed by IWBI verified testing agent)	Assessment based on onsite performance testing (completed by IWBI verified testing agent) with supporting documentation
Every 3 years	Every 3 years	Every year
STRENGTHS		
- More flexibility as based on balanced scorecard approach, with no minimum requirements - Certification process is less onerous and less expensive	- More holistic and thorough assessment - Greater recognition in the UK market - Performance verification process provides confidence in assessment	- Not as intensive as the WELL Building Standard but has evidence based industry recognition - Easy to apply across an entire portfolio
WEAKNESSES		
- Not as well recognised in the UK and less rigorous - Reduced number of points makes it challenging to achieve higher ratings	- Expensive assessment process, with specific minimum standards that must be achieved - Can involve a steep learning curve for project teams	- Re-certification required annually - Not as rigorous or comprehensive given the reduced points available to review

Incorporating Healthy Building Principles in the Development Lifecycle

Development Lifecycle
(Aligned with RIBA plan of works)



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Links Between Healthy Building and BREEAM

BREEAM is a broader sustainability assessment method that covers a wider range of issues, while healthy building certifications such as WELL, WELL ratings and Fitwel focus specifically on promoting health and wellbeing.

While BREEAM and healthy building certifications have some differences in their focus and scope, they share a common goal of promoting sustainable and healthy building design and operation:

Indoor air quality: Both certifications place a strong emphasis on indoor air quality, with requirements for ventilation rates, pollutant control, and a focus on VOC emissions to maintain healthy indoor environments.

Health & wellbeing: Both certifications include requirements for promoting health and wellbeing in buildings, such as access to natural light, thermal comfort, acoustic performance, and amenities that support physical activity.

Sustainability: Both promote sustainable design and operation, with requirements for energy efficiency, water conservation, waste management, and other measures to reduce the environmental impact of buildings.

Aftercare: Both BREEAM and healthy buildings certification appreciate the value in appropriate aftercare and post-occupancy evaluation to reduce the gap between designedv and as-built performance.

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Healthy Buildings and wider ESG strategies

Supporting ESG Goals

Overall, healthy building design and certification supports ESG goals by considering environmental, social and governance factors. They promote sustainable practices that prioritise the health and well-being of their occupants, and ensure responsible governance of the built environment. By following ESG guidelines, these certifications contribute to healthier, more sustainable and more socially responsible buildings. For this reason, healthy buildings accreditations are recognised by international real estate ESG benchmarks like GRESB.

ESG Goals

1 Physical Health

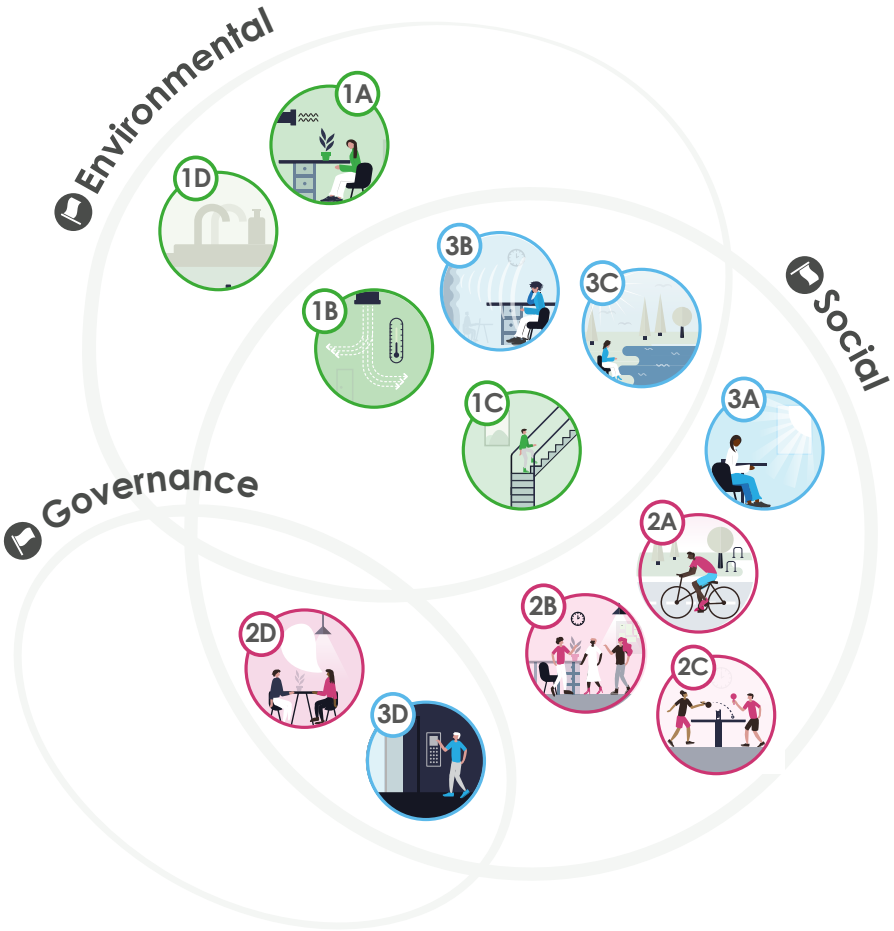
- A Air Quality & Ventilation
- B Thermal Comfort
- C Active Travel & Movement
- D Non-toxic Materials and Chemicals

2 Social Health

- A Healthy Lifestyles
- B Social Interaction
- C Sense of Community
- D Staff Welfare & Support

3 Mental and Emotional Health

- A Exposure to Light
- B Acoustic Comfort
- C Nature & Restorative Spaces
- D Safety and Security



Healthy Buildings and Net Zero

Net zero buildings and healthy building design principles share a number of important features, and there are several ways in which they can be aligned to create buildings that are both energy-efficient and healthy for occupants.

Air Quality and Ventilation: Net zero buildings require high levels of insulation and air tightness to minimise energy loss. This can also help to improve indoor air quality by reducing the infiltration of outdoor pollutants and allergens.

Thermal Comfort: Net zero buildings must be designed to maintain comfortable indoor temperatures with minimal energy use. This aligns with healthy building design principles of prioritising occupant comfort.

Exposure to Light: Net zero buildings often use daylighting strategies to minimise the need for artificial lighting. Healthy building design principles also prioritise access to natural light.

Non-toxic Materials and Chemicals: The combined consideration of material choices to reduce embodied carbon and improve indoor air quality can help to achieve both aims.

Healthy Lifestyles: Net zero buildings often support sustainable travel principles to align with broader organisational net zero goals, encouraging cycling and walking, directly linked to supporting healthier lifestyles.

By combining the principles of net zero buildings and healthy building design, it is possible to create buildings that are energy-efficient, sustainable, and healthy for occupants. These buildings can help to reduce the environmental impact of the built environment while also promoting occupant health and wellbeing.

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WELL Ratings – https://www.wellcertified.com/ratings/

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