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## **ENHANCED INDOOR AIR QUALITY POLICY**

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## 1. SCOPE

HPI Real Estate developed this Indoor Air Quality (IAQ) Policy for properties pursuing green building certifications such as LEED-EB O+M, Fitwel v2.1 Standard, and Fitwel Viral Response Module (VRM). The Indoor Air Quality policy applies to all activities that may degrade the quality of air in the building. Such activities include but are not limited to any ongoing facility maintenance and renovations; the purchasing and use of any materials, chemicals, or furniture; and operation of the HVAC system.

For the purposes of this policy, routine maintenance includes, but is not limited to painting, carpet replacement, and ceiling tile replacement. Renovations include fit outs affecting more than one room, or large rooms such as the lobby or board room, and involve multiple elements, such as moving walls and electrical work, or replacing multiple different architectural finishes.

The following materials are covered under this policy:

- Base building elements permanently or semi- permanently attached to the building (mechanical, electrical, and plumbing components and specialty items such as elevators are excluded). Exclude fixtures and equipment, which are not considered base building elements
- Furniture and furnishings as well as the components and parts needed to maintain them

## 2. GOALS

It is the intent of Enhanced Indoor Air Quality Policy is to maintain the well-being of all building personnel and occupants through the prevention of indoor air quality problems resulting from construction activities and regular operations. IAQ Best Management Practices will be implemented for 100% of renovation projects and 100% of maintenance activities requiring material installation/repair lasting longer than one hour. This policy meets the requirements of the following: Fitwel v2.1 Workplace, Strategy 6.3 – Indoor Air Quality Policy, Fitwel Viral Response Module (VRM), Strategy 1.1 – Enhanced Indoor Air Quality, Strategy 1.1.1 – Humidity Control Policy, Strategy 1.2 – Indoor Air Quality Testing and Monitoring Protocol, and LEED-EB v4.1 O+M certification.

## 3. RESPONSIBLE PARTIES

The HPI Real Estates' Property Management team is responsible for ensuring that this policy is executed, and any contracted vendors involved in facility maintenance and renovation activities are informed of and adhere to the procedures outlined in this policy. If at any time updates are required to this policy, the Property Management team will ensure that the appropriate individuals are informed of the updates.

## 4. PROCEDURES AND STRATEGIES

As part of the Fitwel v2.1 for Workplace, Fitwel VRM, and LEED-EB v4.1 O+M certifications, all building materials must be tested and deemed compliant as non-emitting or low-VOC materials per the California Department of Public Health (CDPH) Standard Method V1.2-2017. Additionally, composite woods (e.g. cabinetry) must meet the California Air Resources Board requirements for ultra-low-emitting formaldehyde (ULEF) resins, or no-added formaldehyde resins.

### Onsite Construction and Renovation Activities

The project site shall track all waste generated due to facility maintenance and renovations, by weight.

HPI shall implement strategies to control the following categories:

- Moisture, such as: storing all absorbent products and materials separately in areas that are protected from dust and moisture; voiding enclosing wet materials during construction.
- Particulates, such as: protecting permanently installed ventilation systems during construction; employing entryway systems at all construction site entrances and exists.
- VOCs, such as: storing VOCs separately from absorbent products and materials; installing all possible paints/coatings and adhesives and sealants prior to absorbent products and materials.

- Noise and vibrations, such as: Reducing noise and vibrations from construction equipment; Ensuring that construction crews wear protective gear
- Outdoor emissions: Developing a plan to protect occupied spaces from outdoor fumes generated by construction activities.
- Tobacco, such as: prohibiting smoking within the construction site.

### **HVAC Protection**

- Store HVAC equipment in a clean, dry location. Until HVAC equipment (ducting, registers, air handler components, fans, motors, plastic tubing, etc.) has been installed, it shall be kept covered with plastic or in a location where it will not be exposed to moisture, dust, or other contaminants.
- Seal all HVAC inlets and outlet. If possible, use of the HVAC system shall be avoided during construction, at least until drywall construction is complete. Temporary ventilation may be installed to remove contaminants. All air inlets and outlets shall be sealed during construction. These include exhaust grills, outdoor air intakes, fume hoods, and exhaust openings on the roof. Openings shall be sealed with plastic and tape that can be removed cleanly.
- Seal HVAC components during installation. For ducting runs that require several days to install, sections shall be sealed off as they are completed. Seals shall be removed prior to continuing the ducting run. Other components of the HVAC system shall be subject to the same requirement to protect them from contamination.
- Use temporary filtration media. If the HVAC system is to be used while construction work is being done, temporary filtration media shall be installed on each return grill. Such filtration media shall have a MERV rating of 8 (per *ASHRAE 52.2-2007*). For air intakes into parts of a building that are sensitive to dust contamination, such as computer rooms, filtration media with a MERV rating of 13 or higher is required. Replace all filtration media prior to occupancy.
- Inspect filters regularly. When the HVAC system is being used during construction and temporary filters are installed, filters shall be inspected weekly and replaced as needed.
- Avoid contaminating mechanical room. The mechanical room should not be used to store construction or waste materials.

### **Source Control**

- Avoid the use of moisture-damaged materials. Any porous materials that have been wetted shall be dried thoroughly before installation. Discard any porous materials that have been damaged, remained wet longer than 48 hours, or show signs of visible mold.
- Use moisture-tolerant materials and set up systems to divert water away from the building.
- Ensure that the construction process will not result in moisture intrusion. In the event of rain or groundwater gaining entry to the building interior during construction, subcontractors shall notify the General Contractor. The wetted areas shall be dried appropriately.
- Regularly check for and eliminate mold.
- Use low-emitting products. Avoid Product substitution. All adhesives and sealants used shall follow VOC requirements of the *South Coast Air Quality Management District (SCAQMD)*. Paints and coatings shall have VOC emissions not exceeding the VOC and chemical component limits of Green Seal's Standard GS-11 requirements.
- Minimize indoor pollution. Where possible and practical, utilize electric or natural gas alternatives for gasoline and diesel equipment; use low-sulfur diesel in lieu of regular diesel. Cycle equipment off when not being used or needed. If indoor construction activities generate combustion emissions, or other airborne contaminants, utilize portable fan systems to exhaust pollution to the outdoors (prevent exhaust from re-entering the building).
- Install appliances that vent directly to the outside, as applicable.
- Dilute and remove pollutants through effective ventilation procedures.

### **Pathway Interruption**

- Protect against moisture exposure. Seal window and door openings with plastic to prevent moisture from entering. Building materials shall be kept dry to avoid the introduction of moisture into the

building interior. If applicable, wrap materials with plastic and seal tightly to prevent moisture absorption. Keep light fixtures and any other materials stored away from the perimeter of the building. Keep stored materials raised approximately 2 inches off the floor with pallets.

- Avoid contaminated air entry into enclosed parts of building. When outdoor construction activities generate excessive dust (especially during landscaping activities), combustion emissions, or other contaminants, operable windows and doors shall be closed. Restrict traffic volume and prohibit idling of motor vehicles where emissions could be drawn into the building. Keep pollutant sources as far away from the building as possible.
- Avoid cross-contamination. Isolate work areas to prevent contaminating clean or occupied areas. Physically contain the clean area with plastic sheeting, prevent foot traffic into the finished space, and create pressure differentials to minimize cross-contamination. When performing a TI within an occupied office building, ensure that the suite undergoing the TI is maintained under negative pressure with respect to the adjacent areas.
- Avoid tracking pollutants into work area. Once TI framing and mechanical system installation starts, access to the building interior shall be controlled to minimize the tracking in of contaminants. Material deliveries and construction waste removal shall be routed via the most direct route to the building exterior of the building rather than through the space. Provide rough track-off grates or matting at the entryway to remove moisture and contaminants from workers' shoes. Prevent the ingress of rodents and pests. No smoking is allowed inside the building.
- Allow high-VOC materials to off-gas prior to installation. When feasible, new plastic, fabric or assembled materials that arrive onsite packaged or rolled-up, to include fabric wall covering, VCT, and graphic sheets, shall be opened up and ventilated preferably for a minimum of 48 hours in an area other than the building where it will be installed. This ventilation space shall be dry, secure, ventilated well, and kept at a temperature between 60°F and 90°F.

## 5. BEST PRACTICES

HPI Real Estate will ensure all Best Management Practices are practiced regularly to ensure the proper control of pollutant sources and moisture, as well as, having a plan for regular filtration maintenance and ventilation practices. Furthermore, the building will regularly monitor current practices and implement practices to improve indoor air, including:

- Implementing a building-wide smoke-free policy (please reference HPI Tobacco- and Smoke-Free Policy)

The following criteria is recommended for HPI to achieve optimal Indoor Air Quality and meet Fitwel v2.1 Workplace certification and/or Fitwel VRM certification:

### Selection of Products and Materials

All new products and materials procured within the project meet the required thresholds from five or more of the product categories below:

- 100% of Interior Insulation
- 100% of Flooring Systems
- 90% of Ceiling Systems by square feet or meters
- 100% of Wall Paneling (including, but not limited to interior wall assemblies, gypsum board, doors, frames, wall coverings, window systems, and interior surfaces of exterior walls)
- 90% by volume for emissions and 100% for VOC content of paints and coatings applied on-site and used on the interior of the air barrier
- 90% by volume for emissions and 100% for VOC of adhesives and sealants applied on-site and used on the interior of the air barrier
- 90% by cost of furniture
- 100% of Composite wood for cabinetry (excluding flooring, ceiling, wall panels, or furniture)

Selected products and materials from the above list are either naturally emitting products or meet one of the following qualifying certifications or standards:

- Certified to UL GREENGUARD Gold.
- Tested and deemed compliant with the California Department of Public Health Standard V1.2- 2017
- Tested and deemed compliant with the AgBB Testing and Evaluation Scheme (2010)
- EN16402
- EN13999
- Green Star – Interiors v1.2 credit 12 for Indoor Pollutants to show compliance with low-emitting materials
- Receive credit for ANSI/BIFMA e3 2019 credits 7.6.1, 7.6.2 and 7.6.3
- California Air Resources Board (CARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings
- California Air Resources Board (CARB) ATCM for formaldehyde requirements for ultra-low-emitting formaldehyde resins (ULEF) or no added formaldehyde resins (NAF)
- South Coast Air Quality Management District SCAQMD Rule 1113
- South Coast Air Quality Management District SCAQMD Rule 1168
- ANSI/BIFMA e3 2019 credits 7.6.1, 7.6.2, and 7.6.3
- EPA TSCA Title VI for ultra-low-emitting formaldehyde (ULEF) resins or no added formaldehyde resins (NAF)

### **Ventilation and Filtration Systems**

For Fitwel, it is recommended that HPI has a certified engineering professional conduct an assessment of the project's ventilation systems for the following:

- Ventilation needs based on occupancy levels, as determined by CO2 levels
- The air changes per hour capacity of the ventilation system
- Opportunities to increase the outdoor air supply and decrease recirculation of air
- Impacts of ventilation adjustments on energy use, thermal comfort, and maintenance needs

The certified engineering professional must also conduct an assessment of the filtration system to identify the following:

- The efficacy of current air filtration practices in removing particulates from the indoor air
- Applicable strategies for increasing air filtration, as needed

The following ventilation enhancements must be implemented:

- Ensure that the system implements 30% higher ventilation levels than those outlined in ASHRAE Standard 62.1 – 2019; OR
- If supporting 30% higher ventilation levels than those outlined in ASHRAE Standard 62.1 – 2019 is not possible, ensure that a minimum of one of the following ventilation levels are met:
  - i. People Outdoor Air Rate (Rp): 10 cfm/person
  - ii. Area Outdoor Air Rate (Ra): 0.18 cfm/ft<sup>2</sup>
  - iii. Combined Outdoor Air Rate: 22 cfm/person
- Avoid the blockage of ventilation supplies, exhausts, and other grilles
- Prioritize natural ventilation techniques that take into account location, climate, and outdoor air quality (i.e. operable windows, doors to the outside, trickle vents, etc.)
- Establish an indoor air quality notification system to alert building management of potential issues
- Provide separate source ventilation for all areas that include the use or storage of chemical products that do not meet the following qualifying standards:
  - i. Green Seal
  - ii. California Code of Regulations
  - iii. EcoLogo

The following filtration enhancements must be implemented:

- Detail regular filtration system for the building, and ensure integration of MERV 13+ filters; OR
- If MERV 13+ filters are not able to be implemented, adopt one of the following filtration methods:
  - i. Upper Room UVGI Light: ASHRAE GPC 37: Guideline for the Application of Upper Air (Upper Room) Ultraviolet Germicidal (UV-C) Devices to Control the Transmission of Airborne Microorganisms)
  - ii. UV-C Light: ASHRAE Standard 185.1: Method of Testing UV-C Lights for use in Air Handling Units or Air Ducts to Inactivate Airborne Microorganisms
  - iii. Mobile filtration unit(s)

The following maintenance procedures for ventilation and filtration systems must be implemented:

- Inspection of HVAC system and peripheral devices to check efficiency, air balance, filter status, and status of the mechanical systems
- Replacement of filters and any worn or non-functioning parts, as needed
- Cleaning evaporators and condensers
- Removals of standing water from drain pans

## Humidity Control

For Fitwel, it is recommended that HPI perform for the following:

Control for relative humidity (RH) by implementing strategies such as:

- Infiltration prevention by sealing any cracks and gaps around windows, doors, lighting fixtures or any other areas
- Ensuring pipe insulation meets requirements established in ASHRAE 90.1 – 2019

Control for microbes and mold in applicable areas by implementing strategies such as:

- Regular inspections for condensation, water damage, and mold growth
- Notification system to report mold or water damage
- Use of mold-resistant materials
- Support air flow
- Implement protocol for drying any damp areas and fixing any leaks within 24–48 hours of discovery

## Indoor Air Quality Testing

As a best practice, it is recommended that HPI conducts an Indoor Air Quality Test on an annual basis and monitors indoor air quality on an ongoing basis, in all regularly occupied areas within the project.

- When monitoring, use RESET Air Accredited Monitors, grade A or B.

For Fitwel v2.1 and VRM, the testing should meet the minimum of four of the following:

- PM2.5: less than 25  $\mu\text{g}/\text{m}^3$
- TVOC: less than 500  $\mu\text{g}/\text{m}^3$
- CO2: less than 1100 ppm or 700 ppm over ambient
- CO: less than 9 ppm
- Formaldehyde: less than 27 ppb
- Relative Humidity: between 30-60%

Except, for Fitwel VRM, properties should test and monitor for the following:

- PM2.5: less than 12  $\mu\text{g}/\text{m}^3$
- CO2: less than 1000 ppm

And three of the following:

- TVOC: less than 500  $\mu\text{g}/\text{m}^3$
- Ozone: less than 0.7 ppm

- CO: less than 9 ppm
- Formaldehyde: less than 27 ppb
- Relative Humidity: between 30-60%

Additionally, the property team shall share the annual indoor air quality testing or monitoring results with all regular occupants through one of the following:

- A digital platform, such as a website, digital application, or display screen in common areas
- A tenant manual
- Communication material such as notification emails or newsletters

If Fitwel v2.1 and VRM indoor air quality metrics are not met, it is recommended that re-testing is conducted for all parameters after a building flush has been completed. Testing should comply with the Fitwel Enhanced Indoor Air Quality (IAQ) Testing/Monitoring Protocol.

By implementing the Indoor Air Quality Testing and Indoor Air Quality Results best practices, Fitwel v2.1 Workplace, Strategy 6.4 – Indoor Air Quality Testing and Strategy 6.5 Indoor Air Quality Testing Results and/or Fitwel VRM, Strategy 1.2 – Indoor Air Quality Testing and Monitoring are met.

### **Managing Closures and Significant Reductions in Occupancy**

For Fitwel, HPI must implement and complete the following procedures prior to re-occupancy in the event that the building is closed for two (2) weeks or longer or occupancy reduces significantly:

- 1) The building will be assessed for mold, excess moisture, and legionella, and any identified issues will be remediated
- 2) If the HVAC system has not been active for two (2) weeks or more, it should be operated for 48 – 72 hours to “flush out” the system
- 3) After the “flush out” period, filters should be examined and replaced if necessary
- 4) If odors are detected during the “flush out” period identify the source, and remediate any residual mold
- 5) Develop a schedule for weekly inspection of the HVAC system for the first month of occupancy. These inspections can be gradually reduced to monthly or quarterly depending on the system’s maintenance needs
- 6) Conduct indoor air quality testing post occupancy in all required as noted in the Fitwel Enhanced Indoor Air Quality (IAQ) Testing/Monitoring Protocol, by following either one of the below:
  - a. conducting qualifying testing annually showing the average levels measured for each required zone
  - b. conducting qualifying monitoring continuously showing monthly averages and peaks lasting for more than one hour during work hours while HVAC systems are operating at design parameters

### **Management and Maintenance**

For Fitwel, regular housekeeping practices must include the following best practices into the scheduled routine to improve indoor air quality:

1. Maintenance of interior plants (i.e. watering, pruning, etc.) where necessary
2. Regular disposal of garbage and waste to prevent pests and odors
3. Hygienic storage of foods, including refrigeration where necessary
4. Prohibit products or other sources of harmful and bothersome odors and contaminants within all spaces of the property site

### **Construction and Renovations**

For Fitwel, HPI must implement a plan for managing indoor air quality during any construction and major renovations prior to occupancy. At a minimum, the following must be controlled:

- Moisture, such as:
  - i. Storing all absorbent products and materials separately in areas that are protected from dust and moisture
  - ii. Avoiding enclosing wet materials during construction
- Particulates, such as:
  - i. Protecting permanently installed ventilation systems during construction
  - ii. Employing entryway systems at all construction site entrances and exists
- VOCs, such as:
  - i. Storing VOCs separately from absorbent products and materials
  - ii. Installing all possible paints/coatings and adhesives and sealants prior to absorbent products and materials
- Outdoor emissions:
  - i. Developing a plan to protect occupied spaces from outdoor fumes generated by construction activities.
- Tobacco, such as:
  - i. Prohibiting smoking within the construction site
- Noise and vibrations, such as:
  - i. Reducing noise and vibrations from construction equipment
- Ensuring that construction crews wear protective gear

For Fitwel VRM, indoor air quality testing must be completed after any construction and major renovations prior to occupancy within all required areas as noted in the Fitwel Enhanced Indoor Air Quality (IAQ) Testing/Monitoring Protocol.

For LEED-EB v4.1 O+M the following must be implemented to meet the Minimum Indoor Air Quality and Indoor Environmental Quality Performance prerequisites:

### **Minimum Indoor Air Quality Performance Prerequisite**

Mechanical Ventilated Spaces shall follow one of the following requirements:

CASE 1 Systems Able to Meet Required Outdoor Airflow Rates - ASHRAE Standard 62.1- 2016:

- Maintain each outdoor air intake, supply air fan, and ventilation distribution system to meet the outdoor air intake flow rates, using the ASHRAE ventilation rate procedure or a local equivalent, whichever is more stringent
- Meet minimum requirements of ASHRAE Standard 62.1- 2016, Sections 6.4.1, Ventilation for Acceptable Indoor Air Quality or local equivalent, whichever is more stringent

CASE 2 Systems Unable to Meet Required Outdoor Airflow Rates:

- Prepare an engineering assessment of the system's maximum outdoor air delivery rate
- Supply the maximum possible to reach the minimum setpoint in CASE 1 and not less than 10 cubic feet per minute of outdoor air per person.

Naturally Ventilated Spaces shall follow the following requirements:

- Determine the minimum outdoor air opening and space configuration requirements using the natural ventilation procedure from ASHRAE Standard 62.1-2016 or local equivalent, whichever is more stringent
- Confirm natural ventilation is an effective strategy for the project by following the flow diagram in the Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Nondomestic Buildings, Figure 2.8
- Meet the requirements of ASHRAE Standard 62.1- 2016, Section 6.4.1, or local equivalent, whichever is more stringent

Mixed-Mode Ventilation shall follow the following requirements:



- Implement a combination of Mechanically Ventilated and Naturally Ventilated strategies, as described above
- Comply with mechanical ventilation requirements when the mechanical system is active
- Comply with natural ventilation requirements when the mechanical ventilation system is inactive

All spaces:

- Indoor air quality procedures defined in ASHRAE Standard 62.1- 2016 may not be used to comply with this prerequisite

During the Performance Period, show compliance through measurements taken at system level within five years of the end of the Performance Period. Additionally, implement and maintain an HVAC system maintenance program, based on ASHRAE 62.1- 2016, Section 8, or a local equivalent, whichever is more stringent, ensuring that the proper O+M of HVAC components for air introduction and exhaust are implemented.

### **Indoor Air Quality Management Program Credit**

HPI shall develop and implement an indoor air quality (IAQ) management program based on the EPA Indoor Air Quality Building Education and Assessment Model (I-BEAM). Include the IAQ management program in the project's current facilities requirements and operations and maintenance plan.

At minimum, the IAQ Management Program must include:

- Outline the team responsible for maintenance
- Procedure to perform a full I-Beam audit at least once every five years
- Preventive maintenance for each piece of equipment
- Periodic inspection for unusual conditions
- Periodic inspection for leaks, rust, dirt, and mechanical problems
- Regular lubrication
- Mechanical and electrical adjustments
- HVAC testing and balancing
- Operational checks
- Parts replacement
- Coil cleaning and filter replacement
- Procedures for repair work orders for when equipment fails or preventive maintenance reveal a problem
- IAQ pollution control protocols

During the Performance Period conduct an I-BEAM on a regular basis (at least once every five years) and revise the IAQ management program as appropriate.

### **Alternative Performance Path option through Arc Platform**

Under the Human Experience Category, the following required test must be implemented:

- Conduct at least one Indoor Air Quality (IAQ) evaluation for total volatile organic compounds (TVOC) and interior carbon dioxide (CO<sub>2</sub>) levels, per representative location of the building (25,000 sf) within a 12-month period.
- The test must occur during normal occupied hours, with the HVAC system starting at the normal start time and delivering outdoor air at the minimum rate
- Position the measurement equipment in the breathing zone, between 3 and 6 feet above the floor
- Record measurements in µg/m<sup>3</sup> for TVOC levels and ppm for CO<sub>2</sub> levels. Include original readings and conversion factors, if readings were taken in other units. Conversion factors must be specific to the instrument used.
- Conduct at least 3 measurements at each location, a minimum of 30 minutes apart. Must record stabilized readings at the time of recording.

Meter name	Default VOC Meter	Meter name	Default CO2 Meter
Meter type	VOCs	Meter type	CO2
Unit of measurement	ug/m3	Unit of measurement	ppm

  

Period Start Date	Period End Date	Highest TVOC Reading (ug/m3)	Period Start Date	Period End Date	Average 95th Percentile CO2 Reading (ppm)
11/2/2016	11/2/2016	88.3	11/2/2016	11/2/2016	527.5

HPI will institute the Indoor Air Quality Policy into relevant leases or a tenant manual.

## 6. TIME PERIOD

This policy was approved and implemented in June 2021 and will be reviewed annually.

## 7. REFERENCES

- *ASHRAE 52.2-2007* standard and products: [www.epa.gov/iaq/pubs/ventilat.html](http://www.epa.gov/iaq/pubs/ventilat.html).
- Fitwel v2.1 Reference Guide: <https://www.fitwel.org/fitwel-standards>
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