SECTION 018119

INDOOR AIR QUALITY MANAGEMENT PLAN

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

C. The contractor shall be responsible for providing and maintaining very high air quality for the duration of construction and upon Substantial Completion when the project is turned over to the owner.

D. This section includes:

1. HVAC Protection
2. Source Control
3. Pathway Interruption
4. Housekeeping
5. Scheduling
6. Building Flushout

1.02 REFERENCE STANDARDS


B. ASHRAE 129-1997: Measuring Air-Change Effectiveness


E. South Coast Air Quality Management District (SCAQMD) Rule #1168: “Adhesive and Sealant Primers”, including most recent amendments.

G. Green Guard Environmental Institute Children and Schools Program - Certified low VOC adhesives, resilient flooring, paints, insulation, acoustical ceiling tiles, etc. See www.greenguard.org.

H. Green Seal (GS) Standard GC-03, VOC limits for anti-corrosive and anti-rust paints.


1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following related work is to be performed under the designated SECTIONS:

1. Temporary barriers, etc. – SECTION 015000-TEMPORARY FACILITIES AND CONTROLS.

2. Final Cleaning – SECTION 017700-PROJECT CLOSEOUT.

1.04 DEFINITIONS

A. “Ventilation” is the process of supplying and removing air to and from interior spaces by natural or mechanical means.

B. “Volatile organic compounds” (VOCs) are chemical compounds based on carbon and hydrogen structures that are vaporized at room temperatures. VOCs are one type of indoor air contaminant.

1.05 SUBMITTALS

A. Indoor air quality plan documentation: Submit the following in accordance with SECTION 013300-SUBMITTALS:

1. Submit for approval twenty (20) digital photographs of construction indoor air quality management measures such as protection of duct and on-site stored or installed absorptive materials.

2. Submit cut sheet(s) of filtration media used during construction and installed immediately prior to occupancy with Minimum Efficiency Reporting Value MERV values highlighted.
3. Submit a letter from the General Contractor describing building flushout procedures including actual dates of building flushout.

1.06 PROJECT CONDITIONS

A. No smoking will be permitted in indoor Project site locations.

B. Construction Ventilation and Preconditioning:

1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate after installation. If continuous ventilation is not possible via building’s HVAC system(s) then ventilation shall be supplied via open windows and temporary fans, sufficient to provide no less than three air changes per hour.

   a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.

   b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.

2. During dust producing activities (e.g. drywall installation and finishing) turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.

3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site.

   a. Condition products without containers and packaging to maximize off-gassing of VOCs

   b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.

   c. “Bake-out” or “super-heating” of spaces to accelerate the release of gaseous emissions is not permitted.
C. Protection:

1. The General Contractor shall be responsible for protecting the Work from moisture, in order to prevent growth of fungus, bacteria and other biological contaminants.

2. Install weatherproof enclosures to protect the work from exterior sources of moisture, in accordance with Division I specifications for materials and installation of weatherproof enclosures.

3. Store construction materials in clean, dry area to prevent porous materials such as gypsum board, insulation, ceiling tile, wood and similar products from becoming wet.

4. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose. Take special care to prevent accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products.
   a. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
   b. Replace moldy materials with new, undamaged materials.

5. In the case that an unanticipated event permits the entry of water into new construction, the General Contractor shall perform procedures to dry out construction within 24 hours. Restoration drying techniques shall be employed to achieve and maintain conditions that will not support biological growth. Consider the use of desiccant drying, which is a very effective way to prevent mold growth and accelerate drying of wet materials, including concrete.
   b. Construction that is not adequately dried out, or which shows evidence of biological growth, shall be removed immediately from the construction area and disposed of legally.
   c. Where construction has been in contact with contaminated water, subsequent cleaning and decontamination shall be supervised by a qualified company as approved by the Owner.
6. **Duct Protection:**
   a. Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside ducts.
   b. Store ductwork in clean, dry conditions and keep ductwork sealed while it is stored.
   c. Wipe down internal surfaces of ductwork immediately prior to installation to remove dust.
   d. Seal open ends uncompleted ductwork and overnight for work in progress.
   e. During installation, protect ductwork waiting to be installed with surface wrapping, etc.

1.07 **SEQUENCING**

A. **Environmental Issues:**

1. **On-Site Application:** Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials (such as ACT). Where this is not possible, protect porous materials with polyethylene vapor retarders.

2. Complete interior finish material installation no less than fourteen (14) days prior to Substantial Completion to allow for building flush out.
PART 2  PRODUCTS

2.01  AIR INFILTRATION MEDIA

A. Minimum Efficiency Reporting Value (MERV) as determined by ASHRAE 52.2-1999:

1. MERV-8 for filtration media used at each return air grill if air handlers must be used during construction.

2. MERV-10 filtration media must be installed in all HVAC equipment prior to building flushout.

3. MERV-13 for filtration media installed at the end of construction.
PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. **Temporary Construction Ventilation:** Provide continuous ventilation during installation of construction materials that emit Volatile Organic Compounds (VOC). Continue ventilation until emissions dissipate. Follow the recommended ventilation times in the CHPS Specification Section 1350 or ventilate for 72 hours, if not specified. Ventilate areas directly to outside areas; do not ventilate to other enclosed spaces. If continuous ventilation is not possible via the building’s HVAC system(s), then ventilate via open windows and temporary fans that sufficiently provide no less than three air changes per hour.

B. **Dust Protection:** Turn the ventilation system off, and protect HVAC supply and return openings from dust infiltration during dust producing activities (i.e. drywall installation and finishing.) Provide temporary ventilation as required.

C. **Preconditioning:** Allow products that have odors and significant VOC emissions to off-gas in dry, well-ventilated space for a sufficient period to dissipate odors and emissions prior to delivery to the construction site. Condition products without containers and packaging to maximize off-gassing VOC’s. Condition products in a ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.

D. **Sequencing:** Where odorous and/or high VOC emitting products are applied on site, apply them prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.

E. **HEPA vacuuming and duct cleaning:** Vacuum carpeted and soft surfaces with a high-efficiency particulate arrester (HEPA) vacuum. If ducts contain dust and dirt, clean them using a HEPA vacuum immediately prior to substantial completion and prior to using the ducts to circulate air. Oil film on sheet metal should be removed before shipment to site. However, ducts will be inspected to confirm that no oil film is present. Remove any oil.

F. **Building Flush Out:** Comply with the following requirements per MA-CHPS:

1. Prior to flushout, filters must be replaced with at least Minimum Efficiency Reporting Value (MERV) 10 filters and replaced again after flushout with a minimum of MERV 13 filters after flushout.
2. Flush out each space once all major finish materials have been installed on floors, walls, and ceilings. This includes all architectural millwork and casework. At that time, each space may be flushed out separately and occupied once 3,500 cubic feet of outdoor air per square foot of floor area of the space has been delivered while maintaining an internal temperature of at least 60°F and relative humidity no higher than 60%. The space may then be occupied provided that it is ventilated at a rate of 0.30 cfm/ft² of outside air or the design minimum outside air rate, whichever is greater, a minimum of three hours prior to occupancy and during occupancy, until the total of 14,000 ft³/ft² of outside air has been delivered to the space while maintaining an internal temperature of at least 60°F and relative humidity no higher than 60%.

G. During construction, meet or exceed all of the following minimum requirements:

1. Mold protection: Building materials, especially those like wood, porous insulation, paper, and fabric, should be kept dry to prevent the growth of mold and bacteria. Cover these materials with plastic to prevent rain damage, and if resting on the ground, use spacers to allow air to circulate between the ground and the materials. Water damaged materials should be dried within 24 hours. Due to the possibility of mold and bacteria growth, materials that are dam or wet for more than 72 hours may need to be discarded. Immediately remove materials showing signs of mold and mildew, including any with moisture stains, from the site and properly dispose of them. Replace moldy materials with new, undamaged materials.

2. Filters: Replace all filtration media immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999.

3.02 CLEANING

A. Final Cleaning Environmental Issues:

1. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products as described in Part 1 of this Section.

2. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products as described in Part 1 of this Section.

3. Vacuum carpeted and soft surfaces with high efficiency particulate arrester (HEPA) vacuum.
4. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. However, ducts shall be inspected to confirm that no oil film is present. Remove oil.

5. Replace all air filters (i.e., pre and final filters) just prior to Substantial Completion.

3.03 PROTECTION

A. Environmental Issues:

1. Protect interior materials from water intrusion or penetration; where interior products not intended for wet applications are exposed to moisture, immediately remove from site and dispose of properly.

2. Protect installed products using methods that do not support growth of molds and mildews.
   a. Immediately remove from site materials with mold and materials with mildew.

3.04 FLUSHOUT

A. Building Flushout - Comply with the following requirements per MA-CHPS:

1. Prior to flushout, filters must be replaced with at least Minimum Efficiency Reporting Value (MERV) 10 filters and replaced again after flushout with a minimum of MERV 13 filters after flushout.

2. Flush out each space once all major finish materials have been installed on floors, walls, and ceilings. This includes all architectural millwork and casework. At that time, each space may be flushed out separately and occupied once 3,500 cubic feet of outdoor air per square foot of floor area of the space has been delivered while maintaining an internal temperature of at least 60°F and relative humidity no higher than 60%. The space may then be occupied provided that it is ventilated at a rate of 0.30 cfm/ft² of outside air or the design minimum outside air rate, whichever is greater, a minimum of three hours prior to occupancy and during occupancy, until the total of 14,000 ft³/ft² of outside air has been delivered to the space while maintaining an internal temperature of at least 60°F and relative humidity no higher than 60%.

END OF SECTION