

SECTION 018119 INDOOR AIR QUALITY (IAQ) MANAGEMENT

PART 1 - GENERAL

RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General [and Supplementary] Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes special requirements for Indoor Air Quality (IAQ) management plan during construction operations.
 - 1. Control of emissions during construction.
 - 2. Moisture control during construction.
- B. IAQ Construction requirements.
- C. Related Sections:
 - 1. Divisions 1 through 33 sections for LEED requirements specific to the Work of each of those sections. These requirements may or may not include reference to LEED.
 - 2. Division 23 Section - Testing, Adjusting, and Balancing for HVAC: Additional requirements for baseline testing for IAQ.
 - 3. Division 23 Section - Testing, Adjusting, and Balancing for HVAC: Cleaning of HVAC system including ductwork, air intakes and returns, and changing of filters.

1.3 REFERENCES

- A. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE):
 - 1. ASHRAE Standard 52.2-2007, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
- B. ASTM International (ASTM):
 - 1. ASTM D5116-97, Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.
- C. Sheet Metal and Air Conditioning National Contractors Association (SMACNA):
 - 1. IAQ Guidelines for Occupied Buildings under Construction, Second Edition-November 2007, Chapter 3.
- D. Definitions: definitions pertaining to sustainable design as defined by ASTM E2114.
 - 1. Adequate Ventilation: Ventilation, including air circulation and air changes, required to cure materials, dissipate humidity, and prevent accumulation of particulates, dust, fumes, vapors, or gases.
 - 2. Hazardous Materials: Any material that is regulated as a hazardous material in accordance with 49 CFR 173, requires a Material Safety Data Sheet (MSDS) in accordance with 29 CFR 1910.1200, or which during end use, treatment, handling, storage, transportation or disposal meets or has components which meet or have the potential to meet the definition of a Hazardous Waste in accordance with 40 CFR 261.
 - a. Hazardous materials include: pesticides, biocides, and carcinogens as listed by recognized authorities, such as the Environmental Protection Agency (EPA) and the International Agency for Research on Cancer (IARC).
 - 3. Indoor Air Quality (IAQ): The composition and characteristics of the air in an enclosed space that affect the occupants of that space. The indoor air quality of a space refers to the relative quality of air in a building with respect to contaminants and hazards and is determined by the level of indoor

air pollution and other characteristics of the air, including those that impact thermal comfort such as air temperature, relative humidity and air speed.

4. Interior Final Finishes: Materials and products that will be exposed at interior, occupied spaces; including flooring, wallcovering, finish carpentry, ceilings, and sealants.
5. Packaged Dry Products: Materials and products that are installed in dry form and are delivered to the site in manufacturer's packaging; including carpets, resilient flooring, ceiling tiles, and insulation.
6. Wet Products: Materials and products installed in wet form, including paints, sealants, adhesives, special coatings, and other materials which require curing.

1.4 QUALITY ASSURANCE

- A. Comply with the requirements of LEED v4 Credit EQc3 Construction Indoor Air Quality Management Plan.
- B. Contractor's Plan shall meet or exceed the recommended design approaches of SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," (Second Edition, 2007, Chapter 3).
- C. Perform material tests and report results in accordance with ASTM D5116.
 1. Moisture control inspections.

1.5 ACTION SUBMITTALS

- A. Indoor Air Quality Plan: Within 14 days after receipt of Notice to Proceed and prior to any waste removal from the project, develop and submit for review a healthy indoor air quality plan. The plan shall include:
 1. List of IAQ protective measures to be instituted on the site.
 2. Schedule for inspection and maintenance of IAQ measures.
- B. Indoor Air Quality Documentation:
 1. IAQ Compliance Documentation: Submit a series of record photographs at three stages during construction to document compliance. Submit at least 18 photographs, six photos taken during each stage, along with identification of measure employed to protect absorptive materials. Photographs to be date stamped and named to identify SMACNA requirement being documented.
 2. Product Data: Submit cut sheets of filtration media proposed during construction, if applicable. MERV 8 required during construction, documented and dated on when filters are replaced. MERV 13 required prior to occupancy.
 3. LEED Submittal: Complete LEED template signed by Contractor.

1.6 INDOOR AIR QUALITY

- A. Goals: Owner has set the following indoor air quality goals for jobsite operations on the project, within the limits of the construction schedule, contract Sum, and available materials, equipment, products and services. Goals include:
 1. Protect workers on the site from undue health risks during construction.
 2. Prevent residual problems with indoor air quality in the completed building.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Low emitting products have been specified in appropriate sections.

2.2 SUBSTITUTIONS

- A. Should the Contractor desire to use procedures, materials, equipment, or products that are not specified but meet the intent of the specifications to protect indoor air quality on the site, the Contractor shall propose these substitutions in accordance with Division 01 Section "Substitutions."

2.3 GENERAL ENVIRONMENTAL ISSUES

- A. Mold and Mildew: Materials that have evidence of growth of molds or mildew are not acceptable, including both stored and installed materials. Immediately remove from site and dispose of properly.
- B. Moisture Stains: Materials that have evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials. Immediately remove from site and dispose of properly.

2.4 AIR FILTRATION MEDIA

- A. Minimum Efficiency Reporting Value (MERV) as determined by ASHRAE 52.2:
 - 1. MERV-8 for filtration media used at each return air grill, if used during construction.
 - 2. MERV-13 for filtration media installed at the end of construction and prior to occupancy.

2.5 CLEANING PRODUCTS

- A. Use low-toxic and lowest-emitting spot removers and cleaning agents for surfaces, equipment, and workers' personal use.
- B. Use HEPA-filter equipped vacuum cleaners for the final cleaning.

PART 3 - EXECUTION

3.1 CONSTRUCTION IAQ MANAGEMENT PLAN

- A. Meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) "IAQ Guidelines for Occupied Buildings Under Construction" Second Edition, 2007, Chapter 3.
- B. HVAC Protection.
 - 1. Protect the ventilation system components from contamination, OR provide cleaning of the ventilation components exposed to contamination during construction prior to occupancy.
 - 2. Seal off all louvers and air intake/discharge points to prevent construction dust and debris from entering.
 - 3. Seal off all ductwork openings and air outlets with plastic sheeting to protect the duct system from dust and debris. Do not re-open until activities that produce dust or pollution, such as drywall sanding, concrete cutting, masonry work, wood sawing, etc. are completed.
 - 4. If the return air system is required to be used during the construction phase, install temporary MERV 8 filters (as determined by ASHRAE Standard 52.2-2007) at each return air opening and provide frequent inspection and maintenance.
 - 5. Under no circumstances shall air be returned from a construction area and then recirculated through the permanent supply ductwork, unless and until the level of construction in the relevant area involves final finishes and trim and the construction has reached a point of complete building dry-in with no sanding and is free from dust, debris, and contaminants.

- C. Source Control.
1. Limit construction traffic and motor idling in the vicinity of air intake louvers when the HVAC systems are activated. Restrict motor vehicles to an area well-removed from air intakes, preventing emissions from being drawn into the building.
 2. Cycle equipment off when not being used or needed.
 3. Use vacuum-assisted sanders and saws to control dust. If sanding or concrete cutting is done outdoors, locate at least 30 feet away from building fresh air intakes, windows and occupant entries.
 4. Cover or seal any waste materials that can release dust, odors, or other contaminants.
 5. Avoid the use of materials and products with high VOC and/or particulate levels. Use products and installation methods with low VOCs such as paints, sealers, insulation, adhesives, caulking and cleaners. Comply with the requirements in Section 01 8113.
 6. Protect all materials, especially absorbent materials such as insulated ductwork, against moisture during delivery to and storage at the job site. Store materials inside the structure in a dry and clean environment pending installation.
- D. Pathway Interruption.
1. Use dust curtains or temporary enclosures to prevent dust from migrating to other areas when applicable. During construction, isolate areas of work to prevent contamination of clean or occupied areas.
 2. Keep pollutant sources as far away as possible from ductwork and areas occupied by workers when feasible.
 3. Isolate work areas and/or create pressure differentials to prevent the migration of contaminants.
 4. Use portable fan systems to exhaust contaminated air directly to the outside of the building, and discharge the air in a means to prevent it from re-entering.
 5. Staging areas should be located away from critical airflow pathways to reduce possible contamination of indoor air.
- E. Housekeeping.
1. General housekeeping and dust suppression programs shall include the use of wetting agents or sweeping compounds. Use effective dust collecting methods such as damp cloths, wet mops, and vacuums with HEPA filters, or wet scrubbers. Perform cleaning activities of building areas on a daily basis, and of HVAC equipment as required.
 2. Keep all coils, air filters, dampers, fans, and ductwork clean during installation, and clean them as required prior to performing the testing, adjusting and balancing of the systems.
 3. Avoid accumulations of water inside the building, and promptly remove any that may occur. Especially protect porous materials such as insulation and ceiling tiles from exposure to moisture.
 4. Remove spills and excessive application of solvent-containing products promptly to prevent any potential hazard. For odorous applications, apply after hours or with sufficient ventilation.
 5. Use low-toxic cleaning supplies for surfaces, equipment, and worker's personal use. Consider using products that comply with Green Seal Standard GS-37 or other environmentally preferable cleaning products.
- F. Scheduling.
1. Include a schedule of all IAQ-related construction activities in the IAQ Construction Management Plan submittal.
 2. To avoid potential contamination of porous or absorbent materials such as ceiling tiles, delay the installation of such until after the drywall, paint, and floor finishing is completed.
 3. Implement IAQ control measures in each phase area until construction in that area is complete. Do not allow contaminants from an area under construction to enter the HVAC ductwork systems or to migrate to completed phase areas.

- 4. Install new MERV 13 (or better) filters at each fan system immediately prior to occupancy for each area.

- G. Conduct regular inspection and maintenance of indoor air quality measures including ventilation system protection, and ventilation rate.

- H. Use regularly scheduled safety meetings to review and report on aspects of IAQ Management. Utilize subcontractor/contractor agreements to facilitate compliance with the IAQ Management Plan.

END OF SECTION 018119