

## **1 General**

### **1.1 REFERENCES**

- .1 Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
  - .1 IAQ Guideline for Occupied Buildings under Construction, 2nd Edition, November 2007
- .2 American National Standards Institute (ANSI)/ASHRAE Standard 52.2-1999: Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size

### **1.2 DEFINITIONS**

- .1 Construction IAQ Management Plan: Outlines measures to minimize contamination in a specific project building during construction and/or describe procedures to flush the building of contaminants prior to occupancy.
- .2 HVAC Systems: Equipment, distribution systems, and terminals that provide the processes of heating, ventilating, or air-conditioning. (ASHRAE 90.1-2007).
- .3 Indoor Air Quality (IAQ): The nature of air inside a building that affects the health and well-being of building occupants. It is considered acceptable when there are no known contaminants at harmful concentrations as determined by cognizant authorities and with which a substantial majority (80% or more) of the people exposed do not express dissatisfaction. (ASHRAE 62.1-2007).
- .4 Minimum Efficiency Reporting Value (MERV): A filter rating established by the ASHRAE 52.2-1999. MERV categories range from 1 (very low efficiency) to 16 (very high efficiency).

### **1.3 SUBMITTALS**

- .1 IAQ Management Plan:
  - .1 Prepare and submit one electronic copy of a Construction IAQ Management Plan within 28 calendar days of contract award for review by the Departmental Representative.
  - .2 Proposed IAQ management methods, techniques, or strategies to address all five SMACNA approaches.
  - .3 Proposed inspection procedures and forms to ensure compliance throughout construction.
  - .4 One (1) copy of the Construction IAQ inspection report checklist.
    - .1 Checklist to contain descriptions of review procedure for checking each potential indoor air quality hazard.
  - .5 Final plan to be submitted within 28 calendar days of receiving the Departmental Representative review comments.
    - .1 Final plan to incorporate review comments provided by the Departmental Representative in order to ensure compliance with this specification.
- .2 Monthly Submissions Requirements
  - .1 Inspection checklists of IAQ management measures:
    - .1 Inspection reports to be coordinated with photographs provided.
    - .2 Inspection reports to indicate areas of the project inspected.
  - .2 Photographs of SMACNA approaches implemented:
    - .1 All five SMACNA approaches must be implemented and documented in each monthly submission.
    - .2 Clearly labelled with the SMACNA approach shown and include a brief description of the measure being documented
    - .3 Photographs to be date-stamped (YYYY-MM-DD).
  - .3 Projects consisting of multiple buildings must provide an additional set of inspection checklists and photographs on a monthly basis for each additional

- .1 Only applies to additional occupied buildings.
- .3 HVAC System Start-Up:
  - .1 Prior to system start-up, submit written notice to the Departmental Representative when permanently installed air handling units are to be operated during construction.

## **2 Products**

### **2.1 Air Filtration Media**

- .1 In accordance with the technical specification sections related to air filtration media.
  - .1 Air handling equipment operated during the construction phase to be fitted with air filtration media of minimum MERV 8 efficiency at all return air grilles.
  - .2 Replace air filters immediately prior to occupancy with MERV 13 filter media in accordance with ASHRAE 52.2.
    - .1 Exceptions are provided for units with 283 L/s (600 cfm) or less, subject to the units being fit-up with highest filtration media commercially available.

## **3 Execution**

### **3.1 CONSTRUCTION IAQ MANAGEMENT PLAN**

- .1 The intent of this plan is to prevent construction and future indoor air quality problems that may result from construction affecting the comfort and well-being of construction workers and building occupants.
- .2 The provision of the Construction Indoor Air Quality Management Plan or IAQ Management Plan is the responsibility of the Contractor.
  - .1 These design approaches shall be applicable for all buildings regardless of whether it is a new construction or renovation.
  - .2 Prohibit smoking within indoor locations and adjacent to building openings.
  - .3 Protect all stored and installed absorptive materials from moisture or dust, chemical and gas damage.
  - .4 During construction use of air handling units, heat recovery ventilators, fans or any associated equipment and systems for ventilation, heating, de-humidification, humidification, dust control or any other use is permissible, provided that filters of MERV 8 or better are installed during operation.

### **3.2 CONSTRUCTION REPORTING**

- .1 Provide all reporting on a monthly basis unless otherwise approved in writing by the Departmental Representative during periods of low IAQ risk construction or minor construction activity on site
- .2 Identify indoor air quality efforts to all relevant subcontractors to ensure that the plan requirements are upheld.
  - .1 During construction, it is the Contractor's duty to remind subcontractors of the plan requirements and confirm that the plan is implemented on site.
  - .2 Keep one hard-copy of the Indoor Air Quality Management Plan on site at all times.
- .3 Where indoor air quality issues remain unresolved for a period longer than two working days during construction.
  - .1 The Contractor will address concerns in weekly meeting minutes and indoor air quality will be recorded as an agenda item.

### **3.3 SMACNA GUIDELINES FOR CONSTRUCTION IAQ**

- .1 Provide the following activities specified to meet or exceed the recommended Design

Approaches in Chapter 3 of the SMACNA IAQ Guidelines for Occupied Buildings under Construction - 1995 during all construction activities. These design approaches shall be applicable for all buildings regardless of whether it is a new construction or renovation:

- .1 HVAC Protection:
  - .1 Use of air handling units, heat recovery ventilators, fans or any associated equipment and systems for ventilation, heating, dehumidification, humidification, dust control is permissible during Construction, provided that filters of MERV 8 or better are installed during operation.
  - .2 Seal off all supply, return and exhaust air system openings to prevent the accumulation of dust and debris in the systems at all times unless work is being completed on the immediate area of the system using plastic seals to the approval of the Departmental Representative. This is to include overnight and longer work stoppages. All diffusers, grilles, and displacement ventilators are also to be sealed in plastic.
  - .3 Keep all operable doors on all air handling units closed at all times unless work is being completed on the immediate area of the system.
  - .4 Do not store construction or waste materials in Fan and Mechanical Rooms.
  - .5 Keep all construction areas clean and neat.
  - .6 Where ducts become contaminated due to inadequate protection these ducts will be cleaned professionally as specified in Division 23.
- .2 Source Control
  - .1 Use of low VOC products, as specified elsewhere, at all times.
  - .2 Restrict traffic volume and idling of motor vehicles where emissions could be drawn into the building.
  - .3 Vent all construction heater products of combustion to the outdoors.
  - .4 Exhaust all pollution sources to the outside with portable fan systems ensuring exhaust does not re-circulate back into the building.
  - .5 Keep containers of VOC containing products closed when not in use.
    - .1 Immediately remove empty containers from the building.
- .3 Pathway Interruption
  - .1 Prevent dust from migrating to other areas with the use of dust curtains or temporary enclosures where applicable.
  - .2 Relocate pollutant sources as far away as possible from construction ventilation equipment, stored materials and areas occupied by workers when feasible. Any construction supply and exhaust systems that ventilate both areas where pollutant sources are being used and areas where they are not been used should be shut down or isolated during such activity with supplemental construction ventilation provided as required.
  - .3 Isolate during construction, areas of work to prevent contamination of clean or occupied areas. Utilize pressure differentials generated by mechanical means to prevent contaminated air from entering clean areas.
  - .4 Ventilate contaminated air from construction areas directly to the outside during installation of VOC emitting materials.
- .4 Housekeeping:
  - .1 Provide special emphasis on HVAC equipment and building spaces to remove contaminants from the building prior to operation of any permanent ventilation equipment.
  - .2 Keep all coils, filters, fans and ductwork clean during installation as

- specified and clean all prior to performing the Testing, Adjusting and Balancing of the systems.
- .3 During construction suppress dust with wetting agents or sweeping compounds. Use efficient and effective dust collecting methods such as a damp cloth, wet mop and vacuums with particulate filters, or wet scrubbers.
- .4 Remove accumulations of water inside the building during construction. Protect all porous materials such as insulation and ceiling tile from exposure to moisture.
- .5 Project site is to be kept clean in order to eliminate the contamination of finished spaces from ongoing construction activities or where entrapped debris and dust may adversely affect indoor air quality in the finished building.
- .6 Protect all porous materials from exposure to moisture.
- .7 Project site is to be kept clean in order to eliminate the contamination of finished spaces from ongoing construction activities or where entrapped debris and dust may adversely affect indoor air quality in the finished building.
- .5 Scheduling:
  - .1 Schedule work to ensure dust emitting work does not coincide with installation of absorbent materials (ceiling tiles, gypsum wall board, fabric furnishings, carpet and insulation) that may act as 'sinks' for dust.
  - .2 Do not schedule any construction activities that would require the use of VOC or dust emitting activities during occupancy without the approval of the Departmental Representative.
  - .3 Schedule all use of VOC emitting and high odorous materials BEFORE installing absorbent materials (ceiling tiles, gypsum wall board, fabric furnishings, carpet and insulation, for example) that may act as 'sinks' for VOCs, odors and other contaminants.

**END OF SECTION**