SECTION 018119

CONSTRUCTION INDOOR AIR QUALITY (IAQ) MANAGEMENT

1. GENERAL
   * + 1. GENERAL PROVISIONS
          1. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
       2. DESCRIPTION OF WORK
          1. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

LEED EQp1, Environmental Tobacco Smoke Control: Prevent exposure of building systems to environmental tobacco smoke during construction.

LEED EQc3, Construction Indoor Air Quality Management Plan: Requirements for minimum indoor air quality (IAQ) performance standards during the construction period.

LEED EQc4, Indoor Air Quality Assessment: Requirements for assessment of minimum indoor air quality (IAQ) performance standards through either building flush-out or air testing before occupancy

* + - * 1. Sustainable Design Intent: Comply with project requirements intended to achieve certification, measured and documented according to the LEED Green Building Rating System, of the US Green Building Council. Refer to Section 018113 - SUSTAINABLE DESIGN REQUIREMENTS, for certification level and certification requirements.
        2. Related Work: The following items are not included in this Section and are specified under the designated Sections:

Section 013233 - PHOTOGRAPHIC DOCUMENTATION for photographic documentation requirements.

Section 013300 - SUBMITTAL PROCEDURES for general submittal requirements.

Section 015000 - TEMPORARY FACILITIES AND CONTROLS for temporary construction facilities, protection, and controls.

Section 017419 - CONSTRUCTION WASTE MANAGEMENT for demolition and construction waste management.

Division 23 - HVAC for coordination with HVAC requirements.

Divisions 02 through 49 Specification Sections for specific requirements relating to indoor air quality.

* + - 1. PERFORMANCE REQUIREMENTS
         1. LEED EQp1, Environmental Tobacco Smoke Control: At a minimum, take the following measures:

Comply with Owner’s Non-Smoking Campus Policy.

Do not allow smoking in enclosed portions of the project site, on the rooftop, or in construction trailers.

This prohibition includes electronic cigarettes.

Locate exterior designated smoking areas at least 25 feet away from entries, outdoor air intakes, and operable windows. Provide signage for designated smoking areas, located within 10 feet of each entry. Provide ash receptacles and clean areas daily.

* + - * 1. LEED EQc3, Construction Indoor Air Quality Management Plan: During construction, comply with the following requirements:

Coordinate with Owner’s current IAQ management plans and procedures.

Meet or exceed the minimum requirements of the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings Under Construction, Second Edition, November 2007, Chapter 3.

If permanently installed air handlers are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 shall be used at each return air grille, as determined by ASHRAE 52.2-2007. Replace filtration media immediately prior to occupancy, according to Division 23 - HVAC.

* + - * 1. LEED EQc4, Indoor Air Quality Assessment: Comply with one of the following requirements:

Option 1: Perform a building flush-out with outside air, either before occupancy or during occupancy.

Option 2: Conduct IAQ testing for air contaminant levels in the building, after construction ends and before occupancy.

* + - 1. SUBMITTALS
         1. LEED EQc3, Construction Indoor Air Quality Management Plan: Within 21 calendar days after receipt of Notice to Proceed, the Contractor shall submit Construction IAQ Management Plan.

Construction IAQ Management Plan: Include, but do not limit to, the following:

HVAC Protection.

Source Control.

Pathway Interruption.

Housekeeping.

Scheduling.

Product Data: Submit for each type of filtration media used during construction and installed immediately prior to occupancy, with MERV values clearly identified.

Delete IAQ Assessment paragraph below if using Owner-engaged IAQ testing.

* + - * 1. LEED EQc4, Indoor Air Quality Assessment:

Retain first two subparagraphs below if using building air flush-out procedures.

Option 1, Flushout: Signed statement describing the building air flush-out procedures, including the dates when flush-out was begun and completed and statement that filtration media was replaced after flush-out.

Product Data: Submit for filtration media used during flush-out and occupancy, with MERV values clearly identified.

Retain subparagraph below if using Contractor-engaged IAQ testing.

Option 2, IAQ Testing: Report from testing and inspecting agency indicating results of IAQ testing and documentation showing compliance with IAQ testing procedures and requirements, with testing laboratory name and date clearly identified.

1. PRODUCTS
   * + 1. FILTRATION MEDIA
          1. Filtration Media: Comply with ASHRAE 52.2-2007 and provide MERV as required.
2. EXECUTION
   * + 1. CONSTRUCTION IAQ MANAGEMENT PLAN IMPLEMENTATION
          1. IAQ Manager: The Contractor shall designate an on-site person responsible for instructing workers and overseeing and documenting results of the Construction IAQ Management Plan for the Project.

Distribution: The Contractor shall distribute copies of the Construction IAQ Management Plan to the Job Site Foreman, each subcontractor, the Owner, and the Architect.

Instruction: The Contractor shall provide on-site instruction of appropriate procedures and methods to be used by all parties at the appropriate stages of the Project.

* + - * 1. Preconditioning: Allow products, which have odors and significant VOC emissions, to off-gas in a dry, well-ventilated space for sufficient period to dissipate odors and emissions prior to delivery to Project.

Remove containers and packaging from materials prior to conditioning to maximize off-gassing of VOCs.

Condition products in ventilated warehouse or other building.

* + - * 1. Ventilation: Ventilate interior spaces directly to the exterior to minimize accumulation of odors and VOC emissions during construction.
        2. Coordinate Construction IAQ Management Plan with construction cleaning as indicated in Section 015000 - TEMPORARY FACILITIES AND CONTROLS and with final cleaning as indicated in Section 017700 - CONTRACT CLOSEOUT.
      1. INDOOR AIR QUALITY (IAQ) ASSESSMENT

If Owner has selected either flush-out or air-quality testing,   
then edit this article:

* + - * 1. LEED EQc4, Indoor Air Quality Assessment: Option 1, Flush-Out:

After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total volume of 14,000 cu. ft. of outdoor air per sq. ft. of floor area while maintaining an internal temperature of at least 60 deg F and a relative humidity no higher than 60 percent.

Operating Requirements: Refer to Division 23 - HVAC.

If occupancy is desired prior to flush-out completion, the space may be occupied following delivery of a minimum of 3500 cu. ft. of outdoor air per sq. ft. of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of 0.30 cfm per sq. ft. of outside air or the design minimum outside-air rate, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of 14,000 cu. ft./sq. ft. of outside air has been delivered to the space.

Operating Requirements: Refer to Division 23 - HVAC.

* + - * 1. LEED EQc4, Indoor Air Quality Assessment: Option 2, Indoor Air Quality Testing: Engage testing agency to perform the following:

Conduct baseline IAQ testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air," and as additionally detailed in the USGBC's "LEED Reference Guide for Building Design and Construction."

Demonstrate that contaminants do not exceed the concentrations listed below:

Formaldehyde: 27 ppb.

Particulates (PM10): 50 micrograms/cu. m.

Ozone: 0.075 ppm.

Total Volatile Organic Compounds (TVOCs): 500 micrograms/cu. m.

Carbon Monoxide (CO): 9 ppm and no greater than 2 ppm above outdoor levels.

Target Volatile Organic Compounds: California Department of Public Health (CDPH) Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, v. 1.1–2010, Table 4-1.

For each sampling point where the concentration exceeds the limit, take corrective action and retest for the noncompliant contaminants at the same sampling points. Repeat until all requirements are met.

Air-sample testing shall be conducted as follows:

All measurements shall be conducted prior to occupancy but during normal occupied hours, and with building ventilation system starting at the normal daily start time and operated at the minimum outside-air flow rate for the occupied mode throughout the duration of the air testing.

Building shall have all interior finishes installed, including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Nonfixed furnishings, such as workstations and partitions, are encouraged, but not required, to be in place for the testing.

Number of sampling locations varies depending on the size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per 5000 sq. ft.

For large open spaces, one sampling point per 50,000 sq. ft. may be used.

Air samples shall be collected between 3 and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum four-hour period.

END OF SECTION