Resource Venture

# Construction IAQ Management for LEED™ 2.1 in Seattle

**This fact sheet provides information and resources to assist Seattle area contractors in achieving LEED™ Indoor Environmental Quality Credit Requirement 3, Construction IAQ Management Plan. This fact sheet is one of several in a series on how LEED™ applies to you. See the fact sheet A Contractor's Introduction to LEED™ for an overview of the U.S. Green Building Council's LEED™ certification system, as it applies to contractors. The Resource Venture also offers free information, assistance and referrals to help you achieve your project's LEED™ goals.**

## LEED™ 2.1 Indoor Environmental Quality Credits 3.1 & 3.2: Construction IAQ Management Plan

The **intent** is to prevent indoor air quality problems resulting from the construction / renovation process in order to help sustain the comfort and well-being of construction workers and building occupants.

Credit 3.1 (1 point) Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

- ❑ During construction meet or exceed the recommended Design Approaches of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings Under Construction, 1995, Chapter 3.
- ❑ Protect stored on-site or installed absorptive materials from moisture damage.
- ❑ If air handlers must be used during construction, filtration media with a Minimum Efficiency Reporting Value [MERV] of 8 must be used at each return air grill, as determined by ASHRAE 52.2-1999.
- ❑ 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 for media installed at the end of construction.

Credit 3.2 (1 point) Develop and implement an Indoor Air Quality (IAQ) Management Plan for the pre-occupancy phase of the building as follows:

- ❑ After construction ends and prior to occupancy conduct a minimum two-week building flush-out with new Minimum Efficiency Reporting Value (MERV) 13 filtration media at 100% outside air. After the flushout, replace the filtration media with new MERV 13 filtration media, except the filters solely processing outside air.

OR

- ❑ Conduct a baseline indoor air quality testing procedure consistent with the United States Environmental Protection Agency's current *Protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445*.

**Indoor Air Quality (IAQ)** refers to the good or bad effects of the air's content inside a building on its occupants. IAQ encompasses dust, mold, chemical pollutants and ventilation.

## LEED™ Documentation Requirements

Each credit a project attempts to achieve using the LEED™ system requires documentation to prove the activity was completed. LEED™ Version 2.1 uses LEED™ Letter Templates to certify that LEED™ requirements are met for each prerequisite and credit. Additional documentation may still be required. The mechanical contractor and general contractor are primarily responsible for the IAQ Plan and will generally be responsible for completing the LEED™ Letter Template and providing additional documentation.

The following is required during Construction (Credit 3.1):

- ❑ Provide the LEED™ Letter Template, signed by the general contractor or responsible party, declaring that a Construction IAQ Management Plan has been developed and implemented, and listing each air filter used during construction and at the end of construction. Include the MERV value, manufacturer name and model number.

AND EITHER

- ❑ Provide 18 photographs - six photographs taken on three different occasions during construction - along with identification of the SMACNA approach featured by each photograph, in order to show consistent adherence to the credit requirements

OR

- ❑ Declare the five Design Approaches of SMACNA IAQ Guideline for Occupied Buildings under Construciton, 1995, Chapter 3, which were used during building construction. Include a brief description of some of the important design approaches employed.

The following is required for Pre-Occupancy (Credit 3.2):

- ❑ Provide the LEED™ Letter Template, signed by the architect, general contractor or responsible party, describing the building flush-out procedures and dates.

OR

- ❑ Provide the LEED™ Letter Template, signed by the architect or responsible party, declaring that the referenced standard's IAQ testing protocol has been followed. Include a copy of the testing results.

**Indoor Environmental Quality (IEQ)** addresses the whole indoor environment and how it affects people in the building. IEQ strategies include issues related to IAQ and also: occupant control of building systems, temperature, daylight and views.

## Additional Recommended Documentation

The following documentation is recommended as good practice for operating an environmentally responsible job-site and as back up for an audit of your project's LEED™ application. A portion of the credits in each application will be audited, and the contractor should be prepared with back-up documentation for credits they are involved in implementing. Documentation includes:

- ■ **A Construction IAQ Management Plan** highlighting the five requirements of the SMACNA IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3. These requirements help minimize contamination of the building from construction activities. They are: HVAC Protection, Source Control, Pathway Interruption, Housekeeping and Scheduling.

## Additional Recommended Documentation (*continued*)

Additionally, the plan should include requirements for replacing filtration media prior to occupancy and address protection of building materials from moisture damage. If your project is also going for Credit 3.2, the Plan will also address building flush-out.

Each plan is specific to the building project. In some cases, the architect may provide a draft plan to you that you can tailor to the situation. In other cases, you will be responsible for creating the plan from scratch.

In either case, the plan should clearly delineate IAQ management roles and responsibilities.

- **Photographs of Construction IAQ Management Measures**
  Throughout the project take photographs of construction IAQ management measures such as protection of ducts, physical barriers protecting areas under construction, and the sequencing of installation for absorptive materials.

- **Cut sheets of filtration media** used during construction and installed immediately prior to occupancy with MERV values highlighted. Filtration media installed prior to occupancy needs to have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999.

## Construction IAQ Management Guidelines

Success for this credit hinges on the contractor. It will be up to you to develop an IAQ Management Plan and collect all the required documentation (see previous page). To assure success, make sure your crew and subcontractors are aware of IAQ procedures and understand their importance. One effective way is to address construction-related IAQ issues in pre-construction and construction progress meetings. Below is a short summary of the key elements in an effective construction IAQ management plan.

- **HVAC Protection**
  Here, the primary goal is preventing construction dust and debris from entering the ductwork and spaces. For example, the return (negative pressure) side of the HVAC system should be isolated from the surrounding environment, especially during heavy construction/demolition. When the ventilation system needs to be operated during construction, install temporary filters, and replace them with clean media just prior to completion/occupancy (see requirements on previous page about MERV values).

- **Source Control**
  The primary way to control sources of pollution is the use of low-emitting paints and other finishes, sealants, adhesives, and carpeting. A number of these may be specified for LEED™ credit on the project already. If you want to use alternative products, be sure you first obtain the review and approval of the architect to confirm that substitute materials meet the requirements. Some alternative products may have different application instructions from products the crew may be more familiar with. Be sure to review application methods for each alternative product before use.

  For materials that you supply, such as cleaning products, use products with low volatile organic compound (VOC) content and/or nontoxic products to minimize building contamination.

- **Pathway Interruption**
  When pollutants are generated, you can use a variety of practical methods to prevent contamination. Strategies include ventilating using 100% outside air during installation of VOC-emitting materials and erecting physical barriers between work areas and non-work areas.

- **Housekeeping**
  Clean frequently to remove construction dust and debris. Promptly clean up spills. Remove accumulated water and keep work areas as dry as possible to discourage the growth of mold and bacteria. Take extra measures when hazardous materials are involved.

## Construction IAQ Mgmt Guidelines (*continued*)

- **Flush-out**
  If your project specifies this part of the credit, conduct a minimum two-week building flush-out with new filtration media and 100% outside air after construction ends and prior to occupancy.

- **Scheduling**
  Your goal here is to carefully control the sequence of construction to minimize the absorption of VOCs by other building materials that can act as "sinks." For example, apply paints, sealants and other volatile materials, and allow them to thoroughly dry before installing ceiling tiles and carpet.

## Moisture, Mold and Construction IAQ

In the moist Pacific Northwest, many buildings have problems with mold growth, which has lead to an increase in childhood asthma rates and other physiological illnesses. The following tips are specifically geared to controlling moisture contamination during construction and should be part of the overall Construction IAQ Management Plan.

- ❑ Remove accumulated water and keep work areas as dry as possible.
- ❑ Use dehumidification to remove moist, humid air from a work area.
- ❑ Never use combustion heaters, generators or equipment inside the building.
- ❑ Protect porous materials from exposure to moisture.
- ❑ Always remove and replace items which remain damp for more than a few hours.

## Cost

- IAQ management efforts may mean additional labor during and after construction to protect and change filters in ventilation systems. The sequence of material installation may require additional time and could potentially delay the date of initial occupancy. However, early coordination between the contractor and subcontractors can minimize or eliminate scheduling delays.

- Many of the IAQ measures listed here also help to protect the health of installation crews. This may mean less lost work days due to work exposure to contaminants.

## Where To Get More Information

- The **Resource Venture's** Sustainable Building Program offers free assistance to Seattle design and construction professionals. Call us to arrange a free visit to your job site or office. We can provide advice on construction IAQ plans and techniques, and address LEED™ questions.

  **www.resourceventure.org**
  **(206) 389-7304**

- ***IAQ Guidelines for Occupied Buildings Under Construction***
  Available from the Sheet Metal and Air Conditioning Contractors' National Association, Inc., 4201 Lafayette Center Drive, Chantilly, VA 20151—1209, or order online at **www.smacna.org/bookstore** or email **info@smacna.org** ($83.00).

- ***LEED™ Reference Guide Version 2.0***
  The Reference Guide discusses the credits and prerequisites of the LEED Rating System™ in depth and provides information on documentation requirements. The architect can give the contractor photocopies of the credits and prerequisites for which the contractor is responsible, or the guide can be purchased at **www.usgbc.org**.

## At Your Service

The Business and Industry Resource Venture provides *free* information, assistance and referrals to help Seattle businesses improve their environmental performance. We are a partnership of the Greater Seattle Chamber of Commerce and Seattle Public Utilities.

www.resourceventure.org
(206) 389-7304