

Instructions

Read this section before completing the Renovation and Repairs Checklist.

Background Information for Renovation and Repairs Checklist

COMMUNICATION

Always provide advance notice and information about school renovation projects to staff, students, and parents to build trust and avoid misunderstandings. Communication should include information about what renovations or repairs will be performed, the project schedule, and how the project will affect school occupants. Provide periodic updates for longer projects.

Designate an individual to respond promptly to any indoor air quality (IAQ) problems that arise during renovation. Ensure that emergency response preparations are appropriate for the work performed. For example, if an emergency exit is blocked, identify an alternative exit and post signs to alert occupants. Be aware that some states have specific regulatory requirements for projects involving asbestos and lead.

PLANNING

When planning for school renovations or repairs, consider the potential for various indoor air problems:

- Toxic pollutants, dust, fumes, or mold released during demolition and construction.
- Ventilation issues due to improper design.
- Off-gassing from building materials and products.

IAQ should remain a priority during project planning. Appropriate contract language and negotiations with service providers and contractors can help ensure that they use proper materials and procedures, such as performing work in the school during unoccupied periods.

Whether the work is performed in-house or by a contractor, complete the checklist (or relevant sections) as appropriate. All completed checklists should be returned to the IAQ Coordinator.

See **Appendix L: “Resources”** in the *IAQ Reference Guide* for additional sources of information on activities related to renovations and repairs.

GENERAL ACTIVITIES

Preparation

Consider conducting renovation work during hours when the school is unoccupied (for example, during summer months). Even during unoccupied times, use ventilation and containment strategies to help prevent the spread of contaminants through the school. Isolate other areas and school occupants from any dust or fumes generated during renovations, which may involve temporarily relocating people. Use plastic sheeting, portable fans, and a mechanical ventilation strategy (where applicable) to prevent dust and fumes from reaching school occupants through hallways, doors, windows, and the ventilation system.

Consider the effect of the renovation on ventilation to avoid:

- Cutting off a room from its supply of outdoor air.
- Enclosing a pollutant source (such as photocopiers) in a room with inadequate exhaust or supply air.
- Erecting barriers (such as new walls) that could prevent adequate movement of air.

Increased housekeeping activities may be necessary during periods of renovation, not only in the renovation area but also in the rest of the school. Ensure that workers and equipment leaving renovation areas do not carry dust and fibers to other parts of the school. Effective practices may include walk-off mats, the use of removable coveralls, and wiping down equipment before exiting the work area.

Asbestos

Do not disturb asbestos during demolition. Most schools have identified and dealt with asbestos in the school under state or federal requirements. Schools that have asbestos-containing materials, as identified in an Asbestos Hazard Emergency Response Act (AHERA) survey, should have a management plan on file at the school. Refer to the management plan when considering whether planned renovations will require disturbing areas containing asbestos and consult an asbestos professional if necessary. Remember to update the AHERA management plan to reflect any asbestos abatement activities.

Mold

Avoid exposure to mold and bacteria. If renovations may expose areas of microbial growth such as mold and mildew (for example, while repairing water damage), consult an environmental professional about protective measures to ensure both worker and occupant safety.

Even dead mold spores can cause allergic reactions and other health effects. See **Appendix H: "Mold and Moisture"** and **Appendix L: "Resources"** in the **IAQ Reference Guide** for more information on mold.

Off-Gassing Materials

Many new products contain constituents (such as resins, solvents, and binders) that off-gas volatile organic compounds (VOCs) for a period of time. Obtain information on potential emissions from new products installed in the school and select low emitting products (when available). Allow adequate time for off-gassing of all products before reoccupying the area. Increase ventilation with outdoor air until off-gassing odors cease. Examples of products that may off-gas include:

- Wall paneling
- Draperies
- Composite wood furniture and cabinets
- Cubicle dividers
- Carpet and vinyl flooring
- Paints and finishes
- Adhesives

PAINTING

Test for lead before removing old paint. A certified inspector (if your state certifies inspectors) or a reputable testing firm should test all areas to be demolished, sanded, or stripped. Use appropriate personnel and precautions when removing and disposing of lead-based paint. Evaluate existing stocks of paint and properly dispose of paints containing lead, mercury, or high VOC emissions.

Exposure to excessive levels of lead can affect a child's mental growth and interfere with nervous system development, potentially causing learning disabilities and impaired hearing. In adults, lead can increase blood pressure.

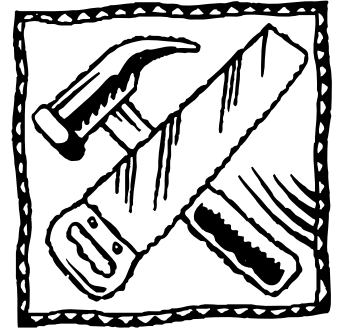
The type of paint you use is an important decision. For instance, both solvent- and water-based paints give off volatile organic compounds that can lead to IAQ problems. Although water-based paints release fewer VOCs than solvent-based paints, they produce these chemicals over a longer period of time.

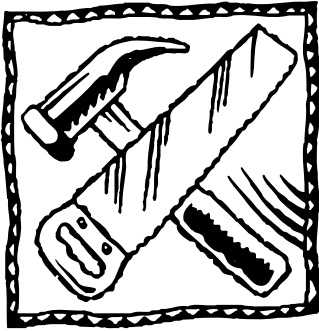
Durability is important. A relatively low-emitting paint might create more IAQ problems in the long run if it is necessary to repaint more frequently. In addition, many water-based paints (even interior paints) have, until recently, used mercury as a fungicide. Do not use any mercury-containing paint indoors.

Evaluate new paint and consult paint manufacturers, suppliers, or other sources about pollutant emissions before purchase.

Schedule painting for times when the building is unoccupied and keep nearby windows and doors closed as much as possible to contain any odors. Temporarily block air intakes in the immediate area to prevent air from being drawn into the ventilation system. In addition, allow time for paint odors to dissipate before occupants return to the area. If the area being painted shares a heating, ventilation, and air conditioning (HVAC) system with other areas, ensure those areas are also unoccupied while painting.

Use supply and exhaust fans to sweep paint fumes out of the building. Operate supply fans continuously (24 hours/day, 7 days/week) at the highest possible outdoor





air supply setting from the beginning of the painting work until several days after completing it. Use conditioned air in humid climates to avoid bringing in moisture.

Seal paint containers carefully after use and keep them in designated storage areas equipped with exhaust ventilation. Never keep paint in rooms connected to the HVAC systems.

Use an appropriate waste disposal method for paints containing lead or mercury. Follow EPA National Emission Standards for Hazardous Air Pollutant rules for disposal of asbestos-containing materials.

FLOORING

Pre-Installation

It is important to select flooring materials carefully, as they can impact IAQ. Flooring materials (and floor-cleaning products) may contain VOCs. Dirty and damp flooring materials can lead to the growth of biological contaminants, such as mold.

Check resilient tile flooring for asbestos fibers before removal. Asbestos surveys conducted under AHERA may have identified asbestos-containing floor tiles. Refer to the inspection report and management plan on file at the school. Follow notification and handling procedures defined under the National Emission Standards for Hazardous Air Pollutants if renovations will disturb asbestos-containing tile flooring.

Vacuum carpets prior to removal. After removing carpets, vacuum subfloor surfaces to avoid releasing dirt, dust, and biological contaminants into the air and onto the new carpet.

If practical, unwrap and unroll flooring products and cushion (if any) in a well-ventilated location (for example, in a ventilated warehouse) prior to installation, preferably not in the school.

Installation

Select low-emitting adhesives and follow manufacturers' recommendations for ventilating the work area. Acquire and review information about product constituents and emissions that may

adversely impact IAQ. When selecting carpet, contact the Carpet and Rug Institute at (800)-882-8846 or www.carpet-rug.com for information on carpet emissions and their carpet testing and labeling program.

Install carpet, vinyl, and related flooring materials only when the school building is unoccupied. An exception would be installing flooring in a small area where you can exhaust the air directly to the outdoors and maintain the room under negative pressure relative to the surrounding rooms and hallways. Avoid recirculating air from the installation area through the HVAC system and into occupied areas. Seal return air grilles, open doorways, open stairways, and use exhaust fans to remove airborne contaminants.

Do not install carpet near water sources or in areas with perpetual moisture problems (for example, near drinking fountains, classroom sinks, or concrete floors with leaks or frequent condensation). Seal new surfaces near water sources to minimize microbial growth in the joints of hard surfaces or on porous flooring.

Vacuum new flooring to remove loose matter and particles generated by the installation process and construction work.

ROOFING

Roofing work often involves the use of tar and pollutant-producing chemicals, which can cause indoor air problems if fumes enter the building. School officials and roofers should cooperate to schedule work for times when the building is unoccupied and to prevent contaminants from entering the building.

Avoid introducing odors and contaminants into the building through the ventilation system. For example, warn staff and students to keep doors and windows closed until the roofing work is finished. Temporarily close outdoor air intakes, especially rooftop intakes in the vicinity of (and downwind from) the work area.

To avoid creating IAQ problems from under-ventilation, provide temporary means (such as fans and/or ducts) to supply outdoor air and reduce pollutant-generating activities indoors.

PROJECT COMPLETION AND COMMISSIONING

Establish IAQ-related procedures and criteria for all renovation projects. These procedures should address the condition of the school when the project is complete:

- **General cleaning**, including wiping surfaces and high-efficiency vacuuming.
- **Cleaning building system components**, including those in the ventilation system that have been contaminated during the project. Ensure proper disposal and replacement of filters during this process.
- **Balancing and testing the ventilation system** if it has been modified, or if areas served by the ventilation system have been altered (for example, if a partition wall was installed or removed).

CONTRACT ADMINISTRATION

When working with outside organizations to complete school projects, contract language should include IAQ specifications and recommendations (such as those found in this background information and checklist). Possible contract specification topics include:

- Notification and communication.
- Scheduling to minimize occupant exposure.
- Selection of building materials.
- Protection of building systems and furnishings, including the ventilation system.
- Use of isolation techniques, including barriers and negative pressure.
- Ventilation and filtration requirements.
- Work practices and housekeeping.
- Material storage.
- Close-out and commissioning criteria.

