



CLEANING MANAGEMENT BACKGROUND

Introduction

Health protection is the primary objective of a building hygiene and cleaning program; maintaining appearance is a secondary objective. Proper cleaning should (a) remove pollutants from surfaces or areas that accumulate contaminants (reservoirs) so that airborne and contact exposures are reduced, and (b) minimize exposure to contaminants from cleaning products. Contaminants impacted by cleaning are often particles, or are attached to particles, and may include:

- ② Allergens (molds and mold spores, dust mite and insect remains, human and animal dander, pollen, rodent droppings)
- ② Infectious disease organisms (viruses, bacteria)
- ② Toxins (pesticides, combustion by-products, organic compounds)
- ② Other (lead, asbestos, other fibrous and mineral particles)

Environmental Cleaning Guidelines

To realize the benefits of a cleaning program, protocols for cleaning and building hygiene must be thoughtfully established and carefully followed, without causing other problems (such as exposure to harmful cleaning products). The following is a list of activities in any successful program.

- ② Establish an appropriate plan and schedule for cleaning activities
- ② Minimize exposure to contaminants by students, staff and cleaning staff
- ② Protect staff and student safety by reducing trip, slip and fall hazards
- ② Maximize the amount of contaminant extracted
- ② Minimize chemical, particle, and moisture residues
- ② Properly dispose of cleaning wastes

temperature, since it can result in scalding at hand sinks and showers. Anti-scald devices can also be used to limit water temperature at these fixtures. Hot water should be available during school breaks.

- ② Clean food spills and wastes promptly, and

CLEANING TO REDUCE ALLERGENS

With the incidence of asthma rising among school-age children, it is important for schools to remove or control allergens that trigger asthma attacks. Thorough cleaning can be very effective at reducing reservoirs of allergens such as dust mites, insect and animal remains or dander, molds, and pollen.

However, cleaning may stir up dust and other allergens into the air which can trigger a response in persons with allergies or asthma. Therefore, most cleaning activities should not be conducted by the cleaning staff when children and other staff are present.

Allergen-Reducing Suggestions

The following cleaning tips will help reduce dust, dirt, allergens and asthma triggers in the school, while helping to protect sensitive individuals from exposure to hazardous cleaning products:

- ② Reduce dirt that enters the building:
 - landscape or pave to reduce foot traffic through muddy areas
 - use an aggressive door mat system between 12 and 15 feet long at each entrance to catch dust, dirt and other tracked-in pollutants such as lead and pesticides. It should consist of an indoor and outdoor portion. Keep the mats clean by vacuuming daily and/or laundering weekly
- ② Dust hard surfaces with a static electric mop, or mop or cloth dampened with water or other non-toxic cleaner weekly. Dusting with a dry mop or cloth will result in more airborne dust, and is more likely to spread dirt from one place to another.
- ② Hot water temperatures should be set to 120[°]F to 125[°]F to increase the effectiveness of many cleaners (less product must be used). But be careful not to exceed this
 - remove garbage daily to avoid attracting pests.
- ② Clean restroom and locker room surfaces to reduce bacterial contamination and mold build-up.
- ② Keep all surfaces, furnishings, and carpeting

clean and dry because mold grows on materials contaminated with soil, especially when moisture is present (see *Mold and Moisture Backgrounder*).

- ② Clean or replace HVAC air filters regularly (a suggested schedule: monthly for permanent filters, every 3 months for disposable filters). Consult with a heating and cooling specialist to determine if medium efficiency, pleated filters will work in your equipment (also see the *Air Cleaning for Airborne Allergens Backgrounder*).
- ② Remove clutter (makes it easier to clean thoroughly and discourages pests).
- ② Do not use deodorizers and odor-masking agents
- ② Use products with little or no odor or fragrances (especially cleaning products).
- ② Minimize the use of powdered or spray cleaners. If using a spray cleaning product, spray the cleaner on a cloth or sponge instead of on the surface being cleaned.

Carpet and Floor Care

Carpeting is widely used in schools throughout the country for a number of reasons:

- ② Lower initial cost
- ② Provides sound attenuation
- ② Comfort for walking and as insulation against cool floors
- ② Reduced risk of slips, falls and injuries

However, because of the tremendous traffic in schools and many sources of dirt and spilled material, a number of operators are becoming increasingly aware of the drawbacks to carpet:

- ② Accumulates dirt, pollutants, odors, and moisture
- ② Vulnerable to developing mold growths
- ② More effort required to maintain in a clean and hygienic condition (including removal of chewing gum).

These disadvantages, coupled with shrinking budgets for school maintenance and operations, have resulted in carpet often being a significant reservoir of indoor contaminants that can impact the health of the students and staff. Proper maintenance of carpets requires a long-term commitment to regular and thorough cleaning procedures.

Vacuumping

Regular and thorough vacuuming is very important in reducing allergens such as dust mites, pollen and pet dander that collect in carpets and upholstery. Upright vacuums or canister styles with a powered nozzle (or beater brush) are best for carpets. They pick up 2 to 6 times as much dust as vacuums without power nozzles. Non-powered attachments are useful for upholstery, blinds and draperies.

Ordinary paper vacuum bags can pass as much as 50% of the problem particles like dust, pet dander, mold and bacteria back into the air where they can be breathed or settle onto surfaces. Use a vacuum with a high efficiency filtration system or high efficiency bags that can capture 75% - 95% of all fine particles. Microfiltration or high efficiency bags can be purchased for most upright and canister style vacuum cleaners. All vacuum fittings and connections should be tight to ensure best results.

- ② Vacuum carpeted areas daily. Vacuum against the carpet's nap, taking at least 6 to 8 strokes over each area.
- ② Vacuum upholstered furniture, blinds and draperies weekly.
- ② Empty the dirt collection bag when it's 1/2 to 2/3 full. If the bag gets full, the suction power is decreased and the vacuum is less efficient. Change bags outdoors to reduce released dust.

Deep Extraction Cleaning

In general, 85% of the soil and dust tracked onto carpeting is dry and reduced by frequent vacuuming. However, even with thorough vacuuming, hot water extraction or 'steam' cleaning is necessary to remove the 15% of soil which is the oily type material. Hot water extraction or 'steam' cleaning should be performed twice per year with a low emission or fragrance-free product. However, make sure the carpeting dries fully within 24 hours, or mold can begin growing. Using fans and opening windows will accelerate the drying process. Residues of the carpet cleaning product should be thoroughly removed.

Carpet Removal

When carpet has reached the end of its useable life, or must be replaced due to a contamination event (mold growth, spill of a hazardous material, etc.), special precautions for removing the old carpet should be taken. To avoid distributing contaminants in the carpet into the room air or other spaces of the building, the carpet first should be cleaned using hot water extraction. While the carpet is still damp, it should be removed and disposed of in a landfill.

New Carpet

When carpet is installed, vapors, known as volatile organic compounds (VOCs), may be released into the air in a process known as "off-gassing." The variety of VOCs emitted are primarily responsible for the odor associated with new carpet installation. These VOCs, and other carpet-related pollutants, originate in the carpet fibers, latex backing, adhesives used to anchor carpet to the floor, carpet fiber dyes, topical treatments such as antistatic and fire retardant agents, and fungicides and pesticides.

Arrange to allow new carpet to "rest" unrolled in a well-ventilated area for at least 24 hours before installation. Purchase low-emitting ("green label") carpet, cushion, and adhesives. Be sure the installer follows Carpet and Rug Institute's installation guidelines, Standard CRI-105.

Provide additional ventilation for at least 48 to 72 hours during and after installation by opening windows, operating exhaust fans, and operating ventilation systems at maximum outdoor air. If possible, schedule carpet replacement to occur when the building is unoccupied, preferably over the weekend or during a break period.

Floor Covering Alternatives

Schools should develop policies for replacing carpet with alternative floor coverings. When carpet is to be replaced, consider substituting hard floor coverings for all or part of the carpet. For example, hard surfaces are preferable in cafeterias and hallways; and small sections of installed carpet, or area rugs that can be laundered, can be used near the teacher's desk for a more comfortable walking surface or for children in early grades to sit on during

reading activities. To reduce noise levels in classrooms with hard floor surfaces, place felt pads or tennis balls on the bottom of chair and table legs (make a small slit in the balls).

GENERAL BUILDING CLEANING

Issues of sanitation and general hygiene are important throughout the building, with special concerns in certain areas. Cleaning practices in a school should minimize the risk of communicating infectious disease from contaminated surfaces or materials. Good housekeeping is also an important element of any cleaning management program -- by keeping rooms organized, and materials properly stored and secured, it makes cleaning easier and more effective and reduces the risk of accidental exposure to hazardous products and materials. Careful selection and use of cleaning products can reduce the exposure of custodial staff, students, and other staff to irritating and potentially health-threatening chemicals.

- ② Keep all custodial closets clean, neatly organized, ventilated, and free from odors.
- ② Change soiled mop heads frequently, using laundered replacements. Remove the dust from dust mops by vacuuming outdoors.
- ② Use toilet bowl brushes and sponges only for cleaning toilet bowls and urinals and store separately from other cleaning devices. Don't use cleaning devices for lavatories and showers for any other purposes.
- ② Toilets, lavatories, and showers should not be used for washing and rinsing of mops, brooms, brushes, or any other cleaning device.

Swimming Pools & Therapeutic Whirlpools

- ② Swimming pools should be maintained and operated according to local health regulations. Pool chemicals can cause chemical burns and may be toxic -- they should be stored with proper ventilation and safety precautions.
- ② Whenever therapeutic whirlpools are used, they must be constructed and maintained for easy cleaning. Whirlpools must be drained and an effective disinfectant applied to the interior surfaces after periods of use. Individuals with open sores or infections are prohibited from using

therapeutic whirlpools. Adequate outdoor air or exhaust ventilation should be provided to these areas to dilute/remove moisture and chemicals that have outgassed from the whirlpool.

Laundry Facilities

- ② A hand sink should be available with soap and hand drying devices (disposable towels or air blow-dryers). A soak sink may double as a hand washing sink.
- ② Mechanical washer(s) and hot air tumble dryer(s) should be used for laundering towels and other items. The items should be washed at a minimum temperature of 130°F for a minimum time of eight minutes. Manual washing and line drying should be discouraged. Dryers must be properly vented to outdoors using hard exhaust duct (not flex duct) to prevent moisture/mold maintenance problems.
- ② Provide a sufficient separation between the area used for sorting and storing soiled laundry and the area used for folding and storing clean laundry to prevent the possibility of cross-contamination.

Cleaning Product Safety

Cleaning products can be potential sources of a number of contaminants. They may contain surfactants, degreasers and sanitizers. Almost all cleaning products contain natural or synthetic surfactants. Surfactants bond oil and water molecules. The surface tension of a mixture of water and a surfactant is lower than that for water alone, resulting in a liquid that wets surfaces more easily. Degreasers are solvents that can dissolve synthetic greases. They frequently have a high pH and are used in products designed to remove lubricants, motor oils and greases. Sanitizers are used when it is important to reduce levels of bacteria, viruses and fungi.

Be sure to read and follow the label directions carefully, and if you have any questions, call the toll-free number found on most product labels. A program to minimize exposure to contaminants from cleaning products consists of the following steps:

- 1. Keep the dirt out of the building:**
Less dirt = Less cleaning product.
- 2. Use cleaning practices that minimize dose.**

- ② Use product systems (e.g., metering stations) that minimize the chance of exposure to concentrated cleaning product
 - ② Match products and methods with cleaning needs to minimize use of the most potent products (e.g., a dust mop when that will do, water and mild surfactant when that's enough; degreasers only on heavy grease or synthetic oils; sanitizers only when needed to reduce levels of viruses, bacteria or mold on surfaces that have already been cleaned; and disinfectants for more thorough cleaning of blood, vomit, or sewage incidents)
 - ② Use methods to apply the products that maximize product effectiveness and minimize the amount of product that gets into the air (e.g., use hot water for cleaning -- each 20°F rise in water temperature doubles the cleaning effectiveness of a surfactant, use damp sponge application rather than sprays).
 - ② Use only as much cleaning product as is necessary for the job; properly store remaining product immediately to prevent accidental spills.
- 3. Avoid products which contain toxins, irritants, allergens and sensitizers.**
 - ② Be aware that even products labeled as 'safe' or 'natural' may contain ingredients that are toxins or irritants.
 - ② Consider using alternatives such as lemon juice, washing soda, baking soda and vinegar.
 - 4. Securely store all hazardous products in areas not accessible to children.**
 - ② Store products in their original containers and keep the original label intact. Product use and storage, disposal instructions, precautions and first aid instructions vary according to their ingredients. It can be dangerous to use a product incorrectly or to follow the wrong emergency treatment guidelines.
 - ② Don't reuse an empty cleaning product container for any other purpose.
 - 5. Don't mix cleaning products.** Products which are safe when used alone can sometimes cause dangerous fumes if mixed with other products (e.g., mixing ammonia

products with chlorine-based products).
6. Don't use products with strong fragrances or odors. They may aggravate allergy or asthma symptoms.

Selecting Alternative Cleaning Products

The following three resources give some guidance in selecting an alternative cleaning system.

- ② The Government Services Administration (GSA) publication "Commercial Cleaning Supplies", February 1996.
- ② The "Housing and Urban Development Technical Guidance Memorandum 91-3, June 6, 1991".
- ② The City of Santa Monica, CA has two lists and a publication, "City of Santa Monica Toxics Use Reduction Program".

This document has been developed for the H.E.L.P. for Kids Project. Contributing to this backgrounder: Bradley Turk and Daniel Hadlich, Mountain West Technical Associates; Terry Brennan, Camroden Associates; Dr. Richard Shaughnessy, University of Tulsa; Dr. Michael P. Vogel, Montana State University Extension. Portions of the information in this backgrounder have been derived from "Cleaning for a Healthy Indoor Environment", G. Pete Consigli and Eugene C. Cole.