Part I: Renovation Activities, Their Potential Hazards and Controls

Introduction
Good news! Your building is undergoing a renovation. This work is vital for maintaining the building as well as upgrading critical support systems such as fire detection and protection, heating, ventilation, air conditioning, and telecommunications. Depending upon the project, it may also bring significant improvements to your physical surroundings.

Although construction safety is a contractual responsibility of the companies performing the work, Yale has in-place a series of review and communication steps to ensure that contractors fulfill their safety obligations with respect to Yale employees. This will ensure that the health and safety of building occupants is not compromised throughout the renovation. The following information is designed to supplement other training you have received and help make the renovation as pleasant and non-disruptive as possible.

Typical Renovation and Construction Activities
Specific work will always vary, but most projects share many of the following steps:

- Pre-work evaluation and safety clearance of area
- Removing of furniture, equipment, and preparing the work area
- Setting up work area barriers and barricades (at times sealing the space) to isolate the renovation activities from other building occupants
- Removing lighting fixtures, shelving, wall mounted cabinets, etc.
- Demolition (interior walls, flooring, ceilings)
- Drilling, chipping, grinding, sandblasting, welding
- Driving pilings and pouring concrete footings and floors
- Removing, renovating, or replacing windows, doors, walls, plumbing, electrical, and telecommunication lines
- Adding fire protection and detection equipment
- Re-roofing (new slate or shingle roofs, pouring flat hot tar)
- Application of stripping, staining, painting, coating, and adhesive products

Continued on page 2
Potential Hazards Associated with Renovation Work

The renovation activities described above can introduce a variety of potential environmental, health, and safety concerns that were not present prior to these activities. These concerns may be due to: (1) disruption of materials found within the building (e.g., asbestos, lead paint, excessive nuisance dust); (2) operations performed by the contractor (e.g., noise); or (3) materials brought into the area by the contractor (e.g., paint or adhesive vapors). Fortunately, the majority of these issues can be identified and appropriately controlled prior to the start of work, and any residual issues are generally of a comfort or nuisance nature, not a health hazard. A renovation is inherently disruptive, dirty and noisy. It is not possible to completely eliminate all of these issues - but they can be minimized.

Table 1 on page 4 provides an outline of potential health and safety issues that may arise as part of a renovation, their sources, possible signs and symptoms of over-exposure, and some of the methods that can be used to control them. The exact method of control will be determined on a "case-by-case" basis and will depend on such factors as: (1) the amount of material being disturbed or being applied; (2) the hazard potential of the material being applied or disturbed; (3) the manner in which the work will be done; and (4) the location of building occupants in relation to the work.

It is important to remember the following when interpreting this table and the potential health effects from renovation related materials:

- The simple presence of one or more of these items or operations does not imply that you will be affected.
- These potential hazards, and particularly the signs and symptoms of over-exposure, have been adopted from Material Safety Data Sheets and other information sources designed for persons who actually perform renovation work and incur significant exposures to them. As such, they should be considered extreme, worst-case scenarios for Yale employees and others who occupy part of a building during a renovation.
- This table does not address effects on the small percentage of individuals who might be highly sensitive due to a personal health condition; this is discussed further in Part II under Special Health Concerns.
- Keep in mind that hazard is not risk, and that the potential for any harm or impact to you is a function of hazard as well as dose (frequency, duration, and magnitude of your exposure to the hazard).

Methods of Controlling Potential Renovation Hazards

A variety of different exposure controls may be used at the work site or in your work area to separate the renovation activities and their contaminants from you. The purpose of a control is to: (1) ensure that you are not exposed to contaminants above established safety standards and guidelines; (2) eliminate or minimize any secondary physiological effects from exposure to low levels of contaminants (i.e. headache or nausea experienced by some individuals exposed to diesel exhaust or asphalt tar below established guidelines); and (3) minimize to the extent possible nuisance odors, dust, noise, and vibration. The specific control used will vary depending upon the nature, extent, duration, and location of renovation work but may include:

- Substitution of products, equipment, or operations with lower hazard ones wherever possible,
- Applying barriers, walls, or enclosures to physically separate contractor from building occupants and controlling access to those areas (Note: never enter or tamper with the contractor’s barriers without permission),
- Adding ventilation to dilute, isolate, or exhaust contaminants and odors,
- Separate by space by temporarily or permanently relocating staff,
- Separate by time by modifying work schedules.

Remember that your eyes, ears, and nose can be extremely effective tools for identifying certain conditions. If you detect a condition you believe could be unsafe, avoid the area and immediately contact your supervisor, building manager, project coordinator, or the Office of Environmental Health & Safety. If you believe there is a fire or other condition that poses a life threatening injury or illness, immediately summon assistance by pulling a fire alarm box or calling the Yale Police Department (111) from any Yale phone.

Part II: Sources Of Information About The Renovation And Materials Used

Introduction

The stress that comes from working near a renovation project can often be relieved with effective communication and readily available information about the project. This information includes a description of: (1) where and what work will occur; (2) basic health and safety information about materials used or released during the renovation; and (3) how to obtain additional assistance. Your supervisor should be your first point of contact for information on these issues or to express your concerns. You have the right-to-know about the hazards associated with the chemicals you use and the chemicals used by others that you are routinely exposed to.

General Information About The Renovation

Information about the renovation and its progress will be disseminated regularly through one or more means including - your supervisor, e-mail messages, postings in public areas, and town-style meetings. Stay abreast of the renovation's progress and particularly any work planned in your area so that a stray odor, noise, or other disruption will not be a surprise.

Special Health Concerns

Some individuals are particularly sensitive to materials that may be used or generated during a renovation. This includes individuals with certain respiratory conditions. If you have an
underlying health condition and are concerned about the effect
the renovation could have on your health, make an
appointment to see Yale’s Employee Health Physician or your
personal physician. If the physician feels that you have a
health condition that could be aggravated by the renovation,
review the physician’s recommendation with your supervisor
and an accommodation with be arranged.

Materials Used Or Generated During A Renovation
If you would like health and safety information about a
material being used in the renovation, request a Material Data
Safety Sheet (MSDS) from your supervisor. Your supervisor
will obtain this health and safety document from your facility
contact or the Office of Environmental Health and Safety
(EHS) as soon as possible. In some cases, personnel from
EHS may actually hand deliver a MSDS to you and review
any concern you may have about the proper control of
materials used in the renovation.

A MSDS is a detailed information document prepared by the
manufacturer or importer of a hazardous chemical or product
that describes physical and chemical properties of the product.
Information included in a MSDS aids in the selection of safe
products, helps employers and employees understand the
potential hazards of a product, and describes how to respond to
exposure situations and spills. Formats for MSDSs vary but the
following information will be found in every MSDS:

• Manufacturer’s identify and product name,
• Composition of product (listing all hazardous chemicals
comprising 1% or greater of the mixture or 0.1% for
carcinogens),
• Physical properties including fire, explosion and reactivity,
• Known health hazards, applicable exposure limits, and
symptoms/health effects associated with overexposure,
• Description of protective equipment worn and engineering
controls used by individuals actually working with the
product,
• Handling and storage information,
• Spill and emergency response instructions.

It should be noted that MSDSs are written for individuals who
directly handle hazardous materials, and typically provide
health and safety guidance that addresses worst case situations
(i.e. a major industrial accident or spill). However, MSDSs
can provide useful information to those with potential "second-
hand" exposures such as product composition, work place
exposure standards, and a description of health hazards
associated with the product.

A more complete description of the information contained in
an MSDS is described in your "Hazardous Material Right-To-
Know Manual". If you do not have a copy, you may request
one from the Office of Environmental Health and Safety. This
manual is also available on our World Wide Web site -
http://www.yale.edu/oehs/
If you need a specific MSDS outside normal working hours

(8:30 to 5:00 M-F), contact the Yale Police dispatcher (432-
4400) and tell them that you need to speak with the on-call
chemical safety representative who will then process your
request.

Evaluating Your Health And Safety Concerns
During the course of a renovation, you may question whether
workers are using appropriate exposure controls or you may be
concerned about contaminants entering your immediate work
area. Discuss these concerns with your supervisor and, if
unresolved, call (or have your supervisor call) your facility
contact, Yale project manager, or EHS for assistance. EHS
will review the activities of the contractor, the materials in use,
and the type of controls or barriers being used to separate the
contractors work area from other building occupants. If
appropriate, EHS may sample air or working surfaces to
evaluate your potential exposure. If you believe that your
work or work environment is making you ill, tell your
supervisor and have them complete a “Supervisors Report of
Injury” and a “Health Service Appointment and Report” form.
If you need immediate medical attention take the forms and go
directly to urgent care at the Health Services Center.
Otherwise make an appointment with the Yale Employee
Health Physician by calling 2-7978.

The Yale University Hazard Communication Program
Contact EHS if you would like more information about
handling hazardous materials safely or Yale University’s
program to communicate with employees about the potential
hazards they face in working with chemicals. OEHS maintains
a written program that describes how information on hazardous
materials is disseminated to those who handle or may come in
contact with them. This document is available for review by
all employees at EHS during normal business hours (8:30 to
5:00 M-F).

References and
Contacts:

Office of Environmental Health and Safety: 5-3550
Yale Fire Marshal’s Office: 2-9923
Employee Health Office: 2-7978
<table>
<thead>
<tr>
<th>Issue</th>
<th>Possible Source(s)</th>
<th>Signs and Symptoms of Over-Exposure</th>
<th>Typical Method(s) of Control (see note)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos</td>
<td>Frangible or broken insulation, disruption of other asbestos-containing materials such as certain plasters, ceiling and floor tiles</td>
<td>Mesothelioma, lung cancer, fibrosis of lung. Typically observed only in workers with long exposures to high airborne concentrations of fibers, conditions which are extremely unlikely among building occupants</td>
<td>Warning signs, state-licensed asbestos abatement contractors to remove or repair damaged asbestos, airtight enclosures and special exhaust filters, air testing during and after abatement work</td>
</tr>
<tr>
<td>Asphalt Fumes</td>
<td>Melting and application of hot asphalt tar for roofs and road surfaces</td>
<td>Hot asphalt has a strong pungent odor that is easily detected far below dangerous levels. Overexposures can cause headaches, dizziness, nausea, and upper respiratory tract irritation</td>
<td>Locate melt pot away from windows, air intakes and other openings, keep windows and doors closed, turn windows air conditioners and fans off</td>
</tr>
<tr>
<td>Chemical Products</td>
<td>Chemical products such as solvent-based paints, stains, adhesives, glues, and sealants</td>
<td>Many coatings and adhesives contain an organic solvent base (petroleum hydrocarbons). Most have good warning properties - odors are easily detected far below dangerous levels. Overexposures to organic solvents can cause headaches, dizziness, and other central nervous system effects, nausea, and respiratory tract irritation. Some organic solvents can have synergistic effects with alcohol and many drugs</td>
<td>Substitute water-based products if possible, physically separate work areas (barriers), ventilate vapors away from building occupants work area</td>
</tr>
<tr>
<td>Chemical Emissions</td>
<td>Off-gases and other residues from carpeting, ceiling tiles, furniture, piping, wood and panel boards, and other newly installed items</td>
<td>These items can off-gas various compounds from adhesives, finishes, etc., used in the fabrication of the item or during its installation. Overexposures could lead to eye irritation, upper respiratory irritation, or headaches</td>
<td>Substitute with items with lower or biogassing potential, “bake” area out at higher temperature before returning occupants, increase ventilation</td>
</tr>
<tr>
<td>Diesel Exhaust</td>
<td>Emissions from diesel-powered vehicles and equipment such as forklifts, compressors, generators, and construction trucks</td>
<td>Detectable at very low concentrations far below dangerous levels. Diesel exhaust is a strong nuisance irritant and can cause nausea, headache, and upper respiratory irritation</td>
<td>Requires exceptional amounts of air to dilute to non-perceptible level. Relocate equipment far from air intakes and windows, keep windows and doors closed</td>
</tr>
<tr>
<td>Dusts (Nuisance)</td>
<td>Drilling, cutting, sanding, chopping, grinding, demolition, and many other activities, including simple cleaning and reorganizing an area</td>
<td>Although dust levels exceeding regulatory limits are very difficult to attain, sensitive individuals and those with underlying respiratory conditions may experience upper respiratory irritation, coughing, and difficulty breathing</td>
<td>Use locally ventilated tools, wet work surfaces down, enclose contractor work area to minimize dust drift, and ventilate dust away from building occupants</td>
</tr>
<tr>
<td>Fiberglass Insulation</td>
<td>Broken or disturbed fiberglass insulation can liberate fibrous glass into the air</td>
<td>Originally considered non-hazardous alternative to asbestos. Fiberglass today is recognized as a respiratory irritant and possible carcinogen upon high, long-term exposure. Fortunately, fiberglass fibers are generally of a size and shape that are not readily admitted to deep lungs. Many people also report skin irritation from contact fiberglass</td>
<td>Report damaged fiberglass to building manager for repair. Enclose and ventilate installation/removal areas in manner similar to asbestos. Relocate occupants temporarily</td>
</tr>
<tr>
<td>Lead Paint</td>
<td>Drilling, cutting, sanding, chopping, grinding, heating, or other vigorous actions to leaked paint surfaces can release dusts or fumes containing lead</td>
<td>Like many heavy metals, lead is a cumulative nervous system and kidney toxin. Young children are most susceptible. If lead paint is not heated or sanded, then ingestion is the route of potential exposure but over-exposures are very unlikely among building occupants. Dark lines in gams, excitability, urinary pain, and reduced mental capacity would indicate overexposure</td>
<td>Locally exhaust ventilation tools, wet work procedures, chemical paint stripping in lieu of mechanical methods. Work area enclosures</td>
</tr>
<tr>
<td>Noise and Vibration</td>
<td>Commonly generated heavy equipment operation, pile driving, grinding, and many electric and pneumatically powered tools</td>
<td>Although hearing loss can occur after long-term exposure to very high noise levels, these kinds of levels are nearly impossible for anyone other than construction workers during a renovation. More likely outcomes from lower level exposures might be headache or dizziness</td>
<td>Physical separation of work area, use of alternative work methods, possible off-hours scheduling, issue hearing protection to those who find noise objectionable</td>
</tr>
<tr>
<td>Silica</td>
<td>Dusts of silica (e.g., quartz) can be generated from cutting, chopping, blasting, and grinding masonry and certain stone</td>
<td>Over-exposures to silicosis occur in the immediate vicinity of certain construction activities, but is unlikely to occur elsewhere. Over-exposures to this mineral can cause upper respiratory irritation and, over many years of continuous exposure, fibrosis of the lung</td>
<td>Apply barrier protection, apply exhaust ventilation, use local exhausts, use locally exhausted tools, issue respirators or supplied air hoods to construction workers</td>
</tr>
<tr>
<td>Welding, Brazing, and Soldering Fumes</td>
<td>Odorous fumes from fluxes, coatings and rod can be liberated during welding, brazing, or soldering</td>
<td>Short-term over-exposures can occur in the immediate work area, where metal fumes and organic vapors can be released. Acute over-exposures can cause upper respiratory tract irritation, headaches, dizziness, and fever</td>
<td>Apply barrier protection, apply exhaust ventilation, use locally exhausted tools, issue respirators to construction workers</td>
</tr>
</tbody>
</table>

Note: The exact method of control will be determined on a "case-by-case" basis and will depend on such factors as (1) amount of material disturbed or applied; (2) hazard potential of material being applied or disturbed; (3) manner in which the work will be done; and (4) location of building occupants in relation to the work.