Chapter 9 – Design Guides

9.8 HAZARDOUS MATERIALS GUIDE

A. GENERAL

1. The State of New York and its state agencies have a large and diverse building portfolio. These buildings may contain hazardous materials. In-house or Consultant designers and Project Managers should anticipate that they may come across hazardous materials during initial site visits to these facilities. All project Designers shall make Project Managers / OGS Team Leaders aware if they suspect that hazardous materials listed in this guide either impact or are impacted by their project.

2. HAZMAT investigation requiring testing, reports and design are typical services provided by the Designers / Project Managers. Construction air monitoring is the responsibility of the Division of Construction and is coordinated by the Director's Representative (EIC) through the use of OGS term contracts. Project Managers should inform client agencies on associated air monitoring and/or project monitoring costs as soon as they are identified.

3. For In-house Designed Projects:
The Designer / Project Manager shall contact the designated Hazmat Design Coordinator or Business Unit Leader in their Business Unit for projects requiring sampling and testing.

See *OGS Asbestos Project Designer Listing.*

The project Designer / Project Manager shall request the services of OGS term contracts to have the investigation, sampling and testing done. The PM should fill out a BDC-83 Request For Hazardous Materials Testing with required information and preferably attach drawings, clearly depicting the sampling locations. For Asbestos sampling requirements, see (Asbestos Hazard Emergency Response Act) AHERA 40 CFR Part 763.

4. For Consultant Designed Projects:
After the initial field visit, if the Designer determines further HAZMAT investigation, sampling and testing is necessary, the Project Manager / OGS Team Leader is encouraged to assign the HAZMAT design portion of the project to the Consultant and their sub-consultant. This assignment provides a single point of responsibility. The Consultant will be responsible for providing the necessary design and design certifications. The Project Manual 000105 Certification Page shall identify the firm's name, and name of the NYS Dept. of Labor (DOL) certified Asbestos Project Designer including their signature and NYS DOL license number for all asbestos projects. All HAZMAT drawings require a PE/RA stamp for construction permitting. All consultant hazmat designs should be reviewed by an in-house OGS Hazmat Designer, whom by the nature of their

review responsibility is then technically defined as the project's Hazmat Reviewer. Hazmat Reviewer designation should be assigned in DCNet's staffing plan by the Project Manager. See *Chapter 5.1 General Information* of this manual for general information on technical documents.

5. Different types of hazardous materials may be encountered in rehabilitation and demolition projects. If required, testing for asbestos, lead and other hazardous materials should be performed in conjunction with one another. Testing should also be done as early as practical during the Program Phase so that costs associated with potential abatement can be considered early in the project. The exception is for fire alarm, CCTV and DDC projects to only do representative samplings that will be expanded during the design phase when work areas are defined and routing of conduits/runs have been established. See item 9 d below.

Designers should coordinate all hazardous materials testing with the Project Manager / OGS Team Leader. It is highly recommended that the Designers accompany the HAZMAT testing team to properly identify work areas and to investigate hidden conditions such as above ceilings and pipe chases. The goal is to eliminate change orders during the construction phase.

6. Brief descriptions of hazardous materials and checklists are included in this Chapter to assist the Designer in determining the likely sources of hazardous materials in a building renovation or demolition project. If you have any questions or comments about the checklists, identify any additional items not found in this list, or would like to discuss an individual project, please contact Subramaniam Nair, P.E., at 518-474-3169 of the OGS HAZMAT Group for further information.

7. This guidance document is not intended as a substitute for reading the rules and statutes and making your own independent determination of their applicability to your building renovation or demolition project. Examples in this guidance document do not represent an exhaustive listing of types of materials that may be required to be removed from a building prior to building renovation or demolition.

8. See *Chapter 9.13 Demolition of Structures* for information related to hazardous materials related to demolition projects. Additionally, see the following link for information related to any type of ceiling tile removal within existing buildings: http://www.labor.ny.gov/formsdocs/wp/CR56.pdf

9. Requests for Hazardous Materials Testing and Sampling:

- **a.** Project Control, Hazmat Requests Processing Unit on the 35th floor processes the requests and assigns them to any of the current, active term contracts (with the testing labs). Contact Hugh Stevens at 518-474-7691 for details.
- **b.** Project Designers shall not pre-approve the lab to arrange a trip to the facility before the written assignment is signed and approved by the Director of Design and received by the lab.
- **c.** Project Managers, with assistance from Hazmat Designers or Hazmat Reviewers, shall fill out form BDC83 Request For Hazardous Materials

Testing with all required information. Attach drawings that clearly state where the removal or disturbance is potentially disturbing any hazardous material.

d. For example: Fire alarm/CCTV installation projects, the request shall include floor plans that identify conduit run and equipment location for:

1) Sampling walls for conduit penetration (drywall, plaster).

2) Sampling ceiling for conduit & system mounts (plaster, ceiling tiles drywall ceilings, and acoustic ceilings).

3) Sampling materials along path (fireproofing, floor tiles, mastics, linoleums, etc,).

4) Recommendations for calculating sample minimum quantity: Sample plaster & fireproofing by 3-5-7 AHERA rule, three (3) samples for all insulations, two (2) samples for any miscellaneous suspect ACM (drywall, ceiling tiles, floor tile and mastics).

e. The testing labs shall coordinate their field trips with the facility and with the project EIC. The project Designer and the Hazmat Designer/Reviewer shall respond to any additional questions. A Designer should request the lab to coordinate trip with the Hazmat Designer/Reviewer and Project Manager so as to briefly discuss the project before the testing lab personnel go out to the field to take samples.

10. Hazardous Materials Testing and Sampling:

a. The lab prepares a report per the requirement of ICR56-5 when the sampling and testing is complete and sends it out to all the names listed on BDC83 Request For Hazardous Materials Testing. Archived results can be accessed at the following site (For In-House Use Only):

http://ogsnow2/DCNet/Projects/Reports/AsbestosSurvey-parameters.asp

b. Recent test results shall be scanned into the system and filed in the *ConsultantContract* and *FacilityInfo* subfolder for use by project Designers in preparing Project Manuals.

11. During construction, the EICs shall request the services of a project monitor for large projects. All required air monitoring for the contract (in-house or consultant design) will be assigned through the current testing term contract. The EICs will employ the services of the air monitoring firm for any required air monitoring and analysis. Since air-monitoring and/or project monitoring costs are part of the Client paid expenditures (and are significant), these costs shall be made available to the Client for review during the project program report phase. Contact Hugh Stevens at 518-747-7691 for work order assignment details.

B. ASBESTOS

1. Asbestos is a naturally occurring mineral that separates into strong, very fine fibers. These fibers float in the air and are easily breathed into the lungs, causing serious health problems.

2. Asbestos is not combustible, has high tensile strength, has good thermal and electrical insulating properties, is moderately resistant to chemicals, and has good frictional properties. It is durable, flexible, strong and resistant to wear. Thus, asbestos was used in numerous building materials.

3. Asbestos was used from 1930 until it was almost entirely banned in 1989. It is most commonly found in fireproofing, insulation, roof shingles, siding, floor tiles, window glazing compound, caulking and a variety of adhesives. Asbestos is a particular concern when it becomes "friable" where brittle fibers can be released into the air and inhaled. You can't tell whether a material contains asbestos simply by looking at it, unless it is labeled. Asbestos presence or absence must be confirmed by professional sampling and laboratory analysis. More information can be found on the U.S. EPA website *http://epa.gov/asbestos*, and NYS DOL web site at:

http://www.labor.ny.gov/workerprotection/safetyhealth/PDFs/PESH/SH%20906.pdf

and in the OGS Hazmat folder at *V:\DesignAndConstr\Common\HazMatInfoBox*.

Key asbestos regulations include:

- OSHA 29 CFR 1926.1101 (Construction Standard);
- EPA 40 CFR Part 61(NESHAP) & 40 CFR 763;
- NYS DOL12 NYCRR 56 (Code Rule 56 Newly amended), and;
- NYS DEC 6 NYCRR 360 & 364

4. NYS DOL recently amended ICR56 and the new ICR and is in effect from September 5, 2006. A key difference is in asbestos "Survey Planning and Design". Previously, sufficient bulk sampling and analysis had to be conducted to ascertain the presence and location of asbestos containing material (ACM). The new requirement goes further. The asbestos survey must now also identify quantities, friability and conditions at the affected portion of the building or structure. Survey shall follow all requirements of subpart 56-5. This rule also requires that permit issuing authority (in our case, OGS) also retain a copy all building surveys. All consultants shall send a copy of building asbestos survey report to the project manager to be stored in the *ConsultantContract* and *FacilityInfo* subfolders.

5. All projects, whether in-house or consultant designs, are required to have an *Asbestos Project Designer* or *Asbestos Project Reviewer* involved from the start of the project to the signing of the certification page (for OGS records). An internal OGS staffing list is located at: *OGS Asbestos Project Designer Listing.*

It should be noted that *Asbestos Project Designers* and *Asbestos Project Inspectors* as defined by the NYS DOL must take a refresher course from a DOL certified instructor each year for re-certification.

For projects involving asbestos contamination assessment, request an OGS HAZMAT Designer to review the variance before submission to NYS DOL.

6. A recent clarification from the NYS DOL stated that a minimum of two samples are required for all miscellaneous suspect ACM per homogenous area. Asbestos type materials can be found on, or in:

Boiler rooms:

- ☐ Boilers, furnaces, fireplaces, and their components
- ☐ Cement sheets near heating equipment
- ☐ Boiler insulation
- ☐ HVAC duct insulation
- ☐ Ductwork flexible fabric connections
- ☐ Fireproofing materials
- ☐ Fire doors

Flooring:

- ☐ Vinyl floor tile
- ☐ Vinyl sheet flooring
- ☐ Asphalt tile
- ☐ Linoleum paper backing
- ☐ Mastic (floor tile, carpet, etc.)

Electrical:

- ☐ Electrical panels
- ☐ Electrical wiring insulation
- ☐ Heating and electrical ducts/conduit

Elevators:

- ❑ Hoistway doors (insulation for fire rating)
- ❑ Finish floor tile and mastic
- ❑ Insulation on wiring on controller
- ❑ Elevator brake pad/lining.

Pipe and other insulation:

- ☐ Aircell (corrugated cardboard)
- ☐ Millboard
- ☐ Preform
- ☐ Joint compound
- ☐ Spray applied insulation
- ☐ Blown-in insulation
- ☐ Block

Surfacing materials:

- ☐ Acoustical plaster
- ☐ Decorative plaster
- ☐ Textured paints coatings
- ☐ Spray applied materials (fire proofing, acoustical, decorative, or insulative)

Roofing:

- ☐ Roofing shingles
- ☐ Roofing felt
- ☐ Base flashing

Cement materials (Transite):

- ☐ Cement pipes (flues & vent pipes)
- ☐ Cement wallboard
- ☐ Cement siding
- ☐ Pegboard

Ceiling Materials: *See the following link for information related to any type of ceiling tile removal within existing buildings:*
http://www.labor.ny.gov/formsdocs/wp/CR56.pdf

- ☐ Ceiling tiles
- ☐ Ceiling tile adhesives (pucks)
- ☐ Lay in ceiling panels
- ☐ Acoustical tiles

Miscellaneous:

- ☐ Taping, joint, and spackling compound
- ☐ Caulking, glazing and putties
- ☐ Fire curtains and blankets
- ☐ Laboratory hoods, table tops, gloves, etc.
- ☐ Gaskets
- ☐ Vermiculate: the attic insulation material of the 60's.

7. Project Manual Related Specification Sections and other Drawing Requirements:

a. 000105 Asbestos Designer Name, Signature and NYS DOL license number (In-house and Consultant Design)
b. 002216 Supplementary Instructions to Bidders – Asbestos Projects
c. 003126 Existing Hazardous Material Information
d. 011000 Summary of the Work
e. 015000 Construction Facilities and Temporary Controls
f. 017329 Removals Cutting and Patching
g. 028213 Asbestos Abatement
h. Edit 011000, 015000 and 017329 sections
i. Include Asbestos Survey Report in the Appendix of all trade specifications (common document), whether sample results test positive or negative for asbestos to alert all the contractors involved of hazards that are present or not present.

1) In-house projects - Retrieve the results from the project, consultant folder in the "V" drive and/or scan and leave it in the common document section in the electronic project specification folder.

2) Consultant projects - preferred method is for the Consultant do the sampling, testing, report and design. Consultant Designer edits the specification and inserts their report in the Appendix of the Project Manual(s). If separate full size drawings are to be provided in the Drawing Set they need to be referenced.

j. Designers shall include the quantity of ACM to be abated under the project in the drawings.

k. In-house projects – Certain projects may require a Variance to be obtained from DOL during the design phase.

1) Complete DOL Form SH-752 "Petition for an Asbestos Variance", available in .PDF format from the Department of Labor website at: *http://www.labor.ny.gov/home*

2) There is a fee of $350 for processing the petition, and the fee must accompany the application. Contact Karyn Agneta on the 35th Floor who will obtain the necessary check from OGS Finance. Forward the completed application and check to:

New York State Department of Labor
Division of Safety and Health
Engineering Services Unit
Building 12, Room 159
State Office Building Campus
Albany, New York 12240

3) If the Petition is approved, a Variance will be granted by the Department of Labor. The Variance will be identified by a specific number. This number, and a copy of the Variance, must be included in the Appendix of the Project Manual.

4) In House Designers can also utilize the "Professional Consultation" option within OGS term contracts for expertise in preparing Variances. See typical "Professional Consultation" assignment.

l. Demolition projects – See Chapter 9.13 of this manual.

m. OGS has term testing contracts in place that can provide testing service if deemed appropriate by the OGS Team Leader and Consultant Designer.

n. If tests are positive, Include Section 028213 in the Project Manual, only in the contract that shall perform the abatement.

o. If an Applicable Variance (AV-#) is utilized for the project, insert a hard copy in the Appendix of the Project Manual.

p. Include section 028213 in the Project Manual, only in the contract that shall perform the Abatement, if tests are positive.

8. Hazmat Designers are cautioned against providing letters to Clients stating that asbestos containing materials are not present and/or was not used during construction of a building, even if it is new construction, without requesting a complete building ACM survey. It may be highly unlikely that asbestos containing materials (ACM) were utilized in new construction, but the fact of the matter remains that contractors can still purchase and install ACM products. Even when we specify non-ACM products, a contractor could still physically substitute an ACM product. It is also an OSHA requirement to identify all ACM within your building/structure prior to renovation, demolition or other construction related activity which would fall under the OSHA construction standard. According to DOL a certified asbestos inspector is the only qualified person to make a visual assessment and determination of ACM.

C. LEAD

1. Lead is primarily a concern as it relates to lead-based paint that is peeling, chipping, chalking or cracking. Paint that dates prior to 1980 is likely to be lead-based. Many buildings have multiple layers of paint and should be examined carefully. Inhaling lead dust can lead to a host of health problems. Lead paint that is good condition does not pose a health hazard. Therefore, only paint that will be disturbed during construction or paint that is in poor condition need be testing. Dust may be tested in buildings that have undergone previous work to establish baseline conditions. Lead paint is tested using an x-ray fluorescence (XRF) machine.

2. Lead can be found in the following areas:
- ☐ Lead Based Paint: (woodwork, metal equipment, interior/exterior)
- ☐ Lead-Acid Batteries: (lighting, exit signs security systems)
- ☐ Lead flashing molds and roof vents:
- ☐ Lead Pipes and solder:

3. More information can be found on the U.S. EPA website at: *http://epa.gov/lead*.

4. Only if the project involves mechanical grinding, flame cutting, torching or welding to a surface containing lead based paint (LBP), abatement is required. On all other projects involving LBP, controlling the spread of lead particles and/or LBP is the key. Specification Section 028304-Handling of Lead Containing Materials, shall be used in the documents.

5. Project Manual Related Specification Sections:
- **a.** 003126 Existing Hazardous Material Information
- **b.** 011000 Summary of the Work
- **c.** 015000 Construction Facilities and Temporary Controls
- **d.** 017329 Removals Cutting and Patching
- **e.** 028303 Abatement of Lead-Containing Materials/or 028304 Handling of Lead Containing Materials.
- **f.** Edit 011000, 015000 and 017329 sections
- **g.** Include Lead Test Results/Survey Report in the Appendix of all trade specifications (common document) whether sample results test positive or negative for lead to alert the contractor of hazards that are present or not present. (Retrieve the results from the project, consultant folder in the “v” drive and/or scan and leave it in the common document section in the electronic project specification folder).
- **h.** Consultant projects - preferred method is for the Consultant do the testing and design. Consultant Designer edits the specification and inserts their report in the Appendix of the Project Manual(s). If separate full size drawings are to be provided in the Drawing Set they need to be referenced, signed and stamped by a PE/RA.
- **i.** OGS has term testing contracts in place that can provide testing service if deemed appropriate by the OGS Team Leader and Consultant Designer.

j. Include Section 028303 in the Project Manual, only in the contract that shall perform the abatement, if tests are positive. e.g.: If flame cutting, torching and welding will be performed on a surface that has lead based paint, abatement is required.

k. Include Section 028304 in the project manual, if tests are positive and lead containing paint will be disturbed during the course of the project, but abatement is not required.

6. Wipe sampling: a pre abatement wipe sampling of the work area is recommended for determining the background lead dust level. Once the abatement is complete, a post dust wipe sampling shall be conducted and results compared for clearance criteria. If the project involves multiple locations of abatement the following method is suggested. The first three painted steel work/abatement locations encountered will be the utilized to develop the method for an acceptable baseline approach for the lead control area, pre abatement wipe samples, employee protection, lead paint removal method, post abatement wipe samples, cleaning criteria and disposal. Once an acceptable method is developed and approved by the independent testing lab hired by the EIC, subsequent testing shall not be required. The contractor may not change the methodology of the certified work plan.

D. MERCURY

1. In general, do not remove mercury from a device such as a switch. Keep the product intact and remove and store in a covered container in a manner that will prevent breakage, spillage, or release. Label and store the mercury containing devices to ensure proper handling and disposal.

2. Project Manual related specification sections:
a. 028700 Mercury Remediation

3. The following checklist will list product categories and examples from each where mercury can be found.

Specialty Buildings and Concerns:
- ☐ Hospitals, Clinics, Laboratories, Dental Offices, and Schools. Mercury can be found in sink traps and many other pieces of equipment and devices. Special care should be given to mercury items in these buildings.

Batteries:
- ☐ Smoke detectors
- ☐ Emergency lighting systems
- ☐ Elevator control panels
- ☐ Exit signs
- ☐ Security systems and alarm

Lighting:
- ☐ Fluorescent lights

- ☐ High Intensity Discharge
- ☐ Metal Halide:
  - ☐ High Pressure Sodium
  - ☐ Mercury Vapor
  - ☐ Neon
- ☐ Switches for lighting using mercury relays: look for any control associated with exterior or automated lighting systems
- ☐ "Silent" wall switches

Heating, Ventilating, and Air Conditioning Systems: Devices in this category control a variety of functions such as water pressure, air pressure, on/off, and flow control. Check any control associated with air handling units.

- ☐ Thermostats
- ☐ Aquastats
- ☐ Pressurestats
- ☐ Firestats
- ☐ Manometers
- ☐ Thermometers

Boilers, Furnaces, Heaters & Tanks:

- ☐ Mercury flame sensors by pilot lights
- ☐ Manometers, thermometers, gauges
- ☐ Pressure-control
- ☐ Float or level controls
- ☐ Space heater controls

Electrical Systems:

- ☐ Load meters and supply relays
- ☐ Phase splitters
- ☐ Microwave relays
- ☐ Mercury displacement relays

Other Industrial Equipment and Areas of Mercury Concern: Any control used for measurement of vacuum, pressure, fluid level, temperature, or flow rate could contain mercury. Included are thermostats, thermometers, manometers, pressurestats, etc. Other switches may have been used in old clocks, water cleaning systems, pneumatic control switches, and other areas.

It is the expectation of the OGS that all equipment control boxes and panels be examined for mercury containing devices prior to renovation or demolition.

3. The following levels of contamination are as outlined in Table 3-1 of the U.S. EPA Region 5 Mercury Response Guidebook:

a. Level 1 – Concentration > or = to 10 $\mu g/m^3$ – requires immediate action.

b. Level 2 – Concentration > 1.0 $\mu g/m^3$ and < 10 $\mu g/m^3$ – schedule evacuation and remediation as soon as possible.

c. Level 3 – Concentration < or = to 1.0 $\mu g/m^3$ – no action required.

4. Project Manual Related Specification Sections:
- **a.** 003126: Existing Hazardous Material Information (If initial testing is done, include copy of report in the Appendix)
- **b.** 011000: Summary of the Work
- **c.** 028700: Mercury Remediation

E. POLY-CHLORINATED BIPHENYLS (PCBs)

1. PCBs are a family of chlorinated compounds that were dielectric or especially non-conductive. PCBs are oily liquids that are usually pale yellow to clear. The following is lists of areas in buildings where PCBs may be found.
- ☐ Transformers
- ☐ Transistors
- ☐ Capacitors (old appliances, electronic equipment)
- ☐ Heat transfer equipment
- ☐ Light ballasts
- ☐ Compressors
- ☐ Casting wax
- ☐ Carbonless carbon paper
- ☐ Pigments
- ☐ Adhesives
- ☐ Caulking and plaster

2. Designers have to be aware of PCBs in caulking, especially in buildings built before 1977. SUNY Construction Fund and all NYS K-12 school projects are required to test caulking for PCBs if they are disturbed or removed as part of a project. Project managers are required to request for PCB testing on all caulking and glazing along with any other required testing, especially in building built before 1977. Request a minimum of one sample per homogenous area.

3. Suspect equipment should be tested for the presence of PCB. If results are positive then the oil shall be drained and the oil and equipment shall be disposed of in accordance with EPA regulations.

4. In the event of a spill, the effected areas need to be tested for contamination. The levels of contamination will be necessary to determine the level of protection for remediation personnel (level A, B, C or D). The necessary protective equipment for each level is established by appendix B of OHSA title 29, Part 1910, Section 120 of the Code of Federal Regulations.

5. Project Manual Related Specification Sections:
- **a.** 003126: Existing Hazardous Material Information (If initial testing is done, include copy of report in the Appendix)
- **b.** 011000: Summary of the Work
- **c.** 028403: Disposal of PCB Liquid Filled Electrical Equipment
- **d.** 028433: Abatement of PCB Containing Caulk Sealant Materials

F. CHLOROFLUOROCARBONS (CFCs)

1. CFCs (chlorofluorocarbons) and HCFCs (hydro chlorofluorocarbons) are man-made refrigerants that destroy the ozone layer.

- ☐ Fire Extinguishers (both portable and installed halon suppression systems)
- ☐ Air conditioners (rooftop, room, and central)
- ☐ Walk in coolers (refrigeration or cold storage areas)
- ☐ Water fountains and dehumidifiers
- ☐ Refrigerators/freezers/chillers
- ☐ Heat pumps
- ☐ Vending machines/food display cases

G. BIRD DROPPINGS

1. Pigeon nesting sites result in a substantial build-up of pigeon droppings, a condition that can be harmful to humans if the material is disturbed and made airborne. Histoplasmosis is a fungal infection resulting from exposure to birds/pigeons/bats droppings. Infectious material enters the body usually by inhalation into the lungs, but in some cases by ingestion through the mouth into the gastrointestinal tract. Birds/pigeons/bats do not carry the organism that causes histoplasmosis. Histoplasmosis is caused by a soil organism that requires the moist, nutrient rich environment that large masses of droppings offer. Areas with small amounts of dried droppings poise minimal hazard.

2. Droppings from birds/pigeons/bats are found on all surfaces near their nests. Human inhalation of infected bird droppings can cause a variety of pulmonary infections (psittacosis, histoplasmosis, and cryptococcosis) resulting in acute respiratory and influenza like symptoms. Persons with immune deficiencies may be particularly susceptible. In addition, some persons exposed to birds/pigeons/bats and their droppings can become hypersensitive to pigeon antigens and develop allergic alveolitis, a condition characterized by lung inflammation (commonly referred to as “pigeon-breeders lung”). The exposure levels required to cause these diseases have not been well defined.

3. Droppings from mice may carry Hantavirus. It is the microbe responsible for Hantavirus Pulmonary Syndrome (HPS), an unusual but severe and sometimes fatal lung infection. The virus is carried by mice and some other small rodents and is contracted by exposure to mouse droppings, urine or saliva. The deer mouse or white footed mouse is believed to be the most common carrier of the virus. This particular mouse species is found throughout New York State.

4. No testing is generally recommended if visible contamination is present and if testing is not warranted on medical reasons. Visual inspection is acceptable as cleaning criteria. For large size projects EIC may request the services of an Industrial Hygienist and obtain final clearance tests, assessment and report.

5. Project Manual Related Specification Sections:

a. 003126: Existing Hazardous Material Information (If initial testing is done, include copy of report in the Appendix)
b. 011000: Summary of the Work
c. 015000: Construction Facilities and Temporary Controls
d. 028733: Bird, Bat & Mouse Droppings Remediation And Disposal

H. MOLD (A type of fungus)

1. Mold, a type of fungus, can grow on any organic substance as long as there is moisture and oxygen. Molds reproduce by making spores and they are common in all environments. Most molds have the potential to cause health effects. They could cause allergies, asthma and they could produce a variety of toxins and irritants, which if inhaled or touched could produce could cause adverse health effects.

2. Eliminating moisture accumulation is the first and the most important step in preventing mold growth. Some of them are to fix water line leaks, prevent surface condensation, increasing ventilation, maintaining space relative humidity between 30-50% and clean and dry all wet or damp spots within 48 hours.

3. If mold is suspected in a building, try to asses the nature and quantity of the contamination. Generally the contamination is divided into three categories. Small (less than 10 square feet of contaminated surface material or any air conveyance system), Medium (greater than 10 square feet but less than 100 square feet of surface contamination), Large or extensive (greater than 100 square feet of surface contamination or greater than 10 square feet of air conveyance system contamination).

4. For small size projects, no testing is generally recommended if visible mold is identified before remediation, Visual inspection is acceptable as cleaning criteria.

5. For medium size projects, no testing is recommended unless the source of mold is unknown, odor persists, litigation is involved and/or if there were previous mold related health issues in the building. If necessary request the services of an Industrial Hygienist (Mycologist), for performing tests and issue initial and final assessment and reports.

6. For large size projects, it is required to request the services of an Industrial Hygienist (Mycologist) and perform tests and obtain an initial assessment report. During the project EIC shall request CIH services and obtain final clearance tests, assessment and report.

7. Required Specification Sections:
a. 003126: Existing Hazardous Material Information (If initial testing is done, include copy of report in the Appendix)
b. 011000: Summary of the Work
c. 015000: Construction Facilities and Temporary Controls
d. 028533: Mold Remediation And Disposal

e. 230595: Cleaning Air Conveyance System Components (If air systems are involved)

8. To request the services of an Industrial Hygienist, fill out form BDC83 and contact Robert Kennedy at 518-486-6051.

9. At this point, no EPA or the Federal threshold limits have been set for mold or mold spores. Air sampling only may not be used to check a building's compliance with federal mold standards.

10. More information can be found on the U.S. EPA website *http://www.epa.gov/mold/* and in the OGS Hazmat folder in: *V:\DesignAndConstr\Common\HazMatInfoBox*.

I. RADON

1. Radon is a naturally occurring radioactive gas, formed by the decay of uranium in soil - occurs throughout US. It enters buildings thru cracks and holes in the foundations and slabs. The radon gas decays into radioactive particles (decay products) and when inhaled becomes trapped in lungs when breathing and the particles in turn decay and release small bursts of radiation. Radon is a known human carcinogen and prolonged exposure causes an increased risk of lung cancer.

2. The radon intensity in a building depends on various factors. They are the radon source strength, permeability - gas mobility under the building, the structure and construction of the building. The type, operation, and maintenance of the heating, ventilation, and air conditioning (HVAC) systems. Time of the day, season and weather (temp, wind, and humidity). For additional information about historic radon measurements taken around New York State, see the NYS Dept. of Health's website at the following link:

http://www.health.ny.gov/environmental/radiological/radon/maps_statistics.htm

3. EPA's radon action level of 4 pCi/L - within school buildings & houses, and any radon exposure carries some risk. Even radon levels below 4 pCi/L pose some risk. Risk can be reduced by lowering radon levels. Action level is based largely on the ability of technologies to reduce elevated radon levels below 4 pCi/L.

4. Two types of interior testing are generally done for radon. A short-term test, which is the quickest and the device remains in an area for 2 to 90 days (usually a canister) and requires a minimum of 48 continuous hours at the site provides an average reading. A long-term test devices remain in place for more than 90 days (alfa track detectors and electrets-ion detectors). These tests measure specific radon levels within an existing building at a specific point in time with a specific set of conditions present. Currently, there is no radon test which measures radon outside at a building site prior to construction that will predict the likelihood of radon occurring, or its potential levels, in a new building. Testing adjacent

existing buildings in an attempt to predict the likelihood of a radon occurrence at a particular site is not reliable.

5. The following are regulations and/or available guidelines/recommendations:
- **a.** IGCC (to be released 2013)
- **b.** NYS GBCA (August 2010)
- **c.** NYS Mechanical Code Section M512
- **d.** ASTM E1465
- **e.** EPA Guideline For Radon Measurement In Schools
- **f.** EPA Radon Reduction Technique in Detached Houses
- **g.** Radon Hazard Sub Code For NJ School Buildings (NYS DOH Recommended)
- **h.** NYS Dept. of Health web published radon information at: *http://www.health.ny.gov/environmental/radiological/radon/radon.htm*

6. Project Manual related specification sections:
- **a.** 130100 Active Soil Depressurization System

7. Best Practice: OGS Division of Design and Construction recommends project Designers and OGS Project Managers discuss the potential impact of indoor air quality, including radon, with their respective client agencies, and that all new buildings or additions are equipped with radon mitigation strategies using EPA methodology and/or recommendations.

8. Several methods are used in combination for radon mitigation.
- **a.** Construction Techniques:
  Sealing joints & cracks and Vapor retarder/gas retarder
- **b.** HVAC System building pressurization
- **c.** Sub Slab Depressurization (passive and active). See example project documents located in:

  V:\DesignAndConstr\Organization\ISO9001\TechnicalResources\Hazmat\08Radon

J. SOIL CONTAMINATION

1. Soil may become contaminated from a number of different sources. A review of the building's prior function will provide insight regarding the types of site testing that may be required for a reasonable and prudent investigation (i.e. pesticides in a Grounds Building, heavy metals in a waste water treatment plant, soil around a flaking, lead painted water tower, petroleum from above and underground tanks, etc.).

2. Project Manual related specification sections:
- **a.** 028335 Lead Contaminated Soil Removal

3. Tank Removal Program – see Chapter 9.21 (reserved).

K. LITHIUM BROMIDE

1. Lithium bromide is the most common absorbent used in commercial cooling equipment, with water used as the refrigerant. The absorption cycle uses a heat-driven concentration difference to move refrigerant vapors (usually water) from the evaporator to the condenser.

2. During absorption chiller removal projects, investigate if lithium bromide is used as an absorbent.

Revision History:

Rev	***Date***	***Description***	***Reviewed by:***	***Approved by:***
0	04/30/12			
1	07/09/14	Revisions to Section A – 4, 5 & 11; B – 5 & 7; C 5 h and I 7.	Nair	Parnett