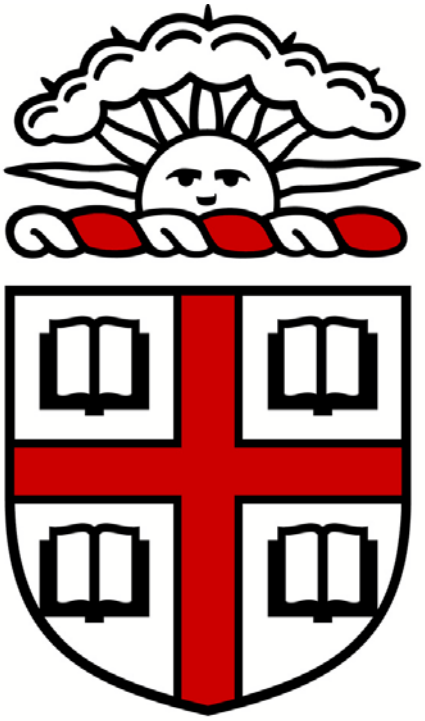

BROWN

Construction Safety & Environmental Management Program

Prepared by:
The Office of Environmental Health & Safety

Section **Page Number**

CONSTRUCTION SAFETY & ENVIRONMENTAL MANAGEMENT PROGRAM

I. Purpose

The purpose of the Brown University Construction Safety & Environmental Management Program is to inform Brown University Project Managers of, and ensure that all Contractors are responsible for, performing work in conformance with all environmental, health and safety laws, regulations and University standards.

II. Scope

Contractors are responsible for conforming to the provisions of the Brown University Construction Safety & Environmental Management Program, which has been prepared for the protection and safety of Brown University students, faculty, staff, neighbors and property.

III. Application

This program applies to Contractors working for Brown University including, but not limited to the following:

- Construction Managers
- General Contractors
- Laboratory Testing Contractors
- Service Contractors
- Sub-Contractors
- Engineers, architects or other design professionals

This program also applies to Task Specific Contractors that are approved for specific contracted work at Brown University. A complete listing of Task Specific Contractors including contact information can be found in Appendix A of this program. Task specific contractors include the following:

- Asbestos Abatement Contractors
- Hazardous Waste Hauling Contractors
- Underground Storage Tank Removal and Fuel Hauling Contractors
- Mold Remediation Contractors
- Industrial Hygiene Consultants
- Lead Abatement Contractors

Portions of this program apply to Brown University personnel including Construction Managers, Engineers, Planners or Project Managers, or personnel who otherwise oversee or direct work being performed by Contractors.

This program applies to any property management company and their contractors and subcontractors who are working on Brown University owned property.

IV. Definitions

CFC Containing Units – Contain any ozone depleting refrigerants including, but not limited to, Chlorofluorocarbons (CFC) and Hydro-chlorofluorocarbons (HCFC).

Confined Space – A space that (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; (2) Has limited or restricted means for entry or exit (for example,

tanks, vessels, silos, storage bins, hoppers, vaults, and pits); and (3) Is not designed for continuous employee occupancy.

Contractor – Non-Brown personnel who have been hired to perform services for the University. Common contractors include, but are not limited to: Construction Managers, General Contractors, Laboratory Testing Contractors, Service Contractors, Sub-Contractors, Engineers, Architects or other design professionals. Also see definition for Task Specific Contractors.

EHS – An abbreviation for Brown University's Office of Environmental Health and Safety. The Fire Safety Office reports to EHS.

EPA – An abbreviation for the United States Environmental Protection Agency.

Fuel Burning Equipment – These units include, but are not limited to boilers, hot water heaters, emergency generators and kilns.

Hazardous Substance – For the purpose of this program, the terms hazardous chemical and hazardous material are synonymous with hazardous substance. Any substance or chemical that poses a physical or health hazard which has the capability of producing adverse effects on the health and safety of humans. Any substance that requires a Material Safety Data Sheet (MSDS).

Hot Work – A temporary operation involving open flames or which produces heat and/or sparks. This includes, but is not limited to: brazing, cutting, grinding, soldering, thawing pipe, torch applied roofing, welding and the use of heat guns.

Laser – An acronym which stands for "Light Amplification by Stimulated Emission of Radiation."

NBC – An abbreviation for the Narragansett Bay Commission; Rhode Island's agency governing wastewater within the city of Providence.

OSHA – An abbreviation for the United States Occupational Safety and Health Administration.

Permit-Required Confined Space – A confined space that has one or more of the following characteristics: (1) Contains or has a potential to contain a hazardous atmosphere; (2) Contains a material that has the potential for engulfing an entrant; (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or (4) Contains any other recognized serious safety or health hazard.

Powder Actuated Fastening Tool – A tool or machine that drives a stud, pin or fastener by means of an explosive charge.

Project Manager – Refers to the Brown University Project Manager, Construction Manager, Engineer, Planner, or other University staff who oversee or direct work being performed by Contractors. This term also refers to the representative from any property management company overseeing or directing work being performed by Contractors.

Public – Refers to Brown University faculty, staff and students not associated with the construction project. It also refers to non-Brown related individuals such as neighbors, pedestrians and by passers.

RIDEM – An abbreviation for Rhode Island Department of Environmental Management; Rhode Island's agency governing environmental issues in the state.

RIDOH – An abbreviation for Rhode Island Department of Health; Rhode Island's agency governing health related issues in the state.

RIPDES – An abbreviation for Rhode Island Pollutant Discharge Elimination System; The Department of Environmental Management's permit program for wastewater/stormwater discharges.

Task Specific Contractors – Also referred to as "Contractors" for the purpose of this program. Task Specific Contractors provide services that require specialized skills, licenses or training, but also require specific approval from EHS, Facilities Management and Purchasing to work at Brown University. Task Specific Contractors are only those contractors listed in the EHS Approved Contractor Listing located in Appendix A.

Universal Waste – Is defined by the RIDEM as a waste of any of the six types listed below that has at least one hazardous waste characteristic, per 40 CFR 261 Subpart C, must be managed as a universal waste if it is not managed as a hazardous waste. Examples include: batteries, pesticides, thermostats, cathode ray tubes (i.e., computer monitors), mercury containing devices, mercury containing lamps.

V. Procedures

A Emergency Procedures

1) Reporting an Emergency (Fire, Police, Medical or Hazardous Substance)

a) Fire, police or medical emergencies related to construction projects at Brown University may be reported to the local emergency agency (i.e., 911) or as specified in the Contractor's own safety manual/emergency plan.
b) In addition, fire, police or medical emergencies related to construction projects at Brown University must be reported to Brown University Public Safety (Public Safety) at 401-863-4111: 24hrs per day - 7 days per week.
   - In emergency situations Public Safety will assist Providence Fire and Police with access to University property.
c) All hazardous substance emergencies related to construction projects at Brown University must be reported to Public Safety at 401-863-4111. Public Safety will contact EHS who will respond and perform or coordinate response activities.

2) Accident, Incident, Injury or Illness Follow-up Procedures

a) All Contractor employees must report unsafe acts or conditions to their supervisors for corrective actions to be taken.
b) The Contractor is responsible for notifying OSHA of any incident or injury that is reportable to that agency.
c) After notifying the appropriate emergency agency, work related accidents, incidents, injuries and illness must be immediately reported to the Project Manager. The Project Manager is responsible for notifying EHS as necessary to assist with follow up.
   - Examples of when the Project Manager and EHS must be notified include: loss time injuries, an injury that requires transportation to a hospital or other serious injury.
d) Any accident or injury involving the public or Brown faculty, staff and students must be reported to the Project Manager and EHS immediately.

B General Safety Procedures at Brown

1) Basic Expectations for Contractor Personnel

a) The following are several reasons for temporary or permanent removal of a Contractor and/or its employee(s) from Brown University premises.
- Possession or use of alcoholic beverages or illegal drugs not prescribed by a physician.
- Possession of explosives, firearms, ammunition and/or other weapons.
- Deliberate violation of safety or security rules.
- Illegal dumping, handling or disposal of hazardous materials.
- Destruction or removal, without written permission, of any property belonging to Brown University, the property owner/resident, employee or other contractors or employees.
- Intimidating, threatening, harassing, impeding or interfering with an inspector, security officer or Brown University employee, student, designated representative or the public.
- Using emergency exits other than for emergencies or blocking emergency exits.
- Misuse/tampering or disabling of fire prevention, detection or suppression equipment.
- Unauthorized removal or destruction of a safety barricade, handrail, guardrail, warning sign, fall protection or other warning devices intended to protect Brown University faculty, staff, students, property or the public.

2) Safety Permits & Approval Procedures

a) The approval for general construction work is typically granted by the Project Manager. However there are specific work permits and approvals that must be obtained prior to starting certain potentially hazardous activities. Permits and approvals should be requested during normal business hours and with reasonable lead-time unless specifically stated in this program.

b) Contractors must notify the Project Manager prior to performing the following activities unless the project documents specifically request the activity:
- Working on electrical, steam, high temperature hot water, chilled water systems or other energized systems.
- Working on heating, ventilation or air conditioning equipment.
- Working in confined spaces on campus (see the confined space section of this project).
- Working on security systems.
- Working with hazardous substances (including solvents and paints).
- Using powder actuated tools.
- Operating a power vehicle or self-propelled work platform.
- Excavation or trenching.
- Working with compressed air or gases.
- Working on a roof.

c) Contractors must obtain approval from the Project Manager prior to performing the following activities:
- Changing occupied building egress pathways during construction.
- Working on fire detection or suppression systems.
  (a) Suppression system impairments must be reported to the University's insurance carrier through the Fire Safety Office (401-863-3462).
- Moving emergency equipment (fire extinguishers, first aid kits, etc.) provided by Brown.
- Shut down of any Brown owned utility.

(a) Only Brown University Facilities Management staff may shut down or start up Brown owned utilities. The Project Manager will assist in coordinating with Facilities Management Operations, in advance of the need for such shutdowns or startups.

- Working with or impacting suspect asbestos-containing materials (see the asbestos section of this project).
- Installing a temporary electrical service.
- Using a gas, diesel or LP (propane) powered engine indoors.
- Lifting or hoisting with cranes, derricks, hoists or helicopter.
- Performing blasting operations.
- Using University owned equipment or property to assist in performing work. Contractors must provide all necessary tools and equipment to safely complete their work.
- Any additional work not listed in the project documents which have a high risk of injury to the contractor and its employees or the public.

d) Contractors must obtain approval from EHS (401-863-3353) prior to performing the following activities:

- Activity or work which may disrupt service to safety equipment.
  (a) Including but not limited to: emergency eyewash/shower stations, fume hoods/laboratory ventilation, fire protection, autoclaves, etc.
- Performing hot work.
- Modifying an egress pathway either inside or outside of a building.
- Using Class 3B or 4 lasers.
- Using licensed radioactive material sources in portable gauges, analyzers, or to conduct radiography.
- Installing antennas capable of transmitting radio frequency (RF) energy in excess of FCC or OSHA standards.
- Working in a chemical or solvent storage area.
- Performing any indoor air quality sampling (i.e., mold sampling).
- Installing any air monitoring equipment on University property.
- Purchasing or installing respiratory equipment for future use of University employees.
- Shipping of hazardous waste (including waste oil & lead-containing materials).
- Performing any excavation dewatering operations.

3) Site Safety & Security

a) Contractors are responsible for ensuring that work areas are completely secured at all times.

- All exterior work sites must be secured by fully encompassing physical barriers that are appropriate for the work site location.
  (a) Isolate the work area with fences, barricades, safety markers, tape barriers, blinker lights or other means that is appropriate to the work being performed.
  (b) Maintain a physical barrier around all machinery, equipment and hoisting/staging areas.
  (c) Cones and caution tape are not adequate protection for a busy campus environment. Proper barriers like properly supported snow fencing, crowd control fencing or temporary chain link fencing must be installed.
- If there are any breaks in a physical barrier (i.e., truck entrances) they must be appropriately staffed to ensure that the public do not access the site.
- All open holes, manhole, trenches or excavations to which the public may fall must be covered and/or guarded by a railing system. All manhole covers must be completely

secure at all times unless someone is actively in the space working. Partially open manhole covers are unacceptable.
- All personnel within the site boundaries must be wearing appropriate PPE as necessary.
- All work areas are to be secured during off work hours to prevent unauthorized access. Only Brown University owned locks, keyed with contractor cores, can be utilized on construction fencing. Contact the Project Manager for coordination of these locks.
- If work is being performed in a public roadway, the contractor is responsible for contacting the city and making all arrangements for police details and/or street closures. The contractor must also coordinate this with the Project Manager.
- The contractor is responsible for providing the proper way-finding signage necessary to direct both vehicular and pedestrian traffic safely around or through the work area.

b) Maintenance of building egress and public walkways.
- All occupied buildings must maintain all egress pathways in good working order at all times. If an egress pathway needs to be modified during construction, the Project Manager must inform the Fire Safety Office at 401-863-3462 prior to the change.
- Adequate way-finding signage should be provided whenever changes to building egress or public walkways are made. The contractor must also coordinate this with the Project Manager.

4) Housekeeping for Construction Areas

a) The Contractor is responsible for ensuring and maintaining good housekeeping while at Brown University. The Contractor must keep work areas neat, clean, orderly and free of excess trash debris and never block walkways, stairs, and exits or create a tripping hazard. Failure to maintain good housekeeping in a work area may result in increased potential for safety hazards and incidence of accidents and chemical spills. Do not perform work over the heads of people or leave tools or equipment overhead.
b) The Contractor shall ensure that all construction related materials that are stored or actively being used on elevated surfaces (i.e., roofs) be secured at all times. Contractors shall make an effort to minimize materials on elevated surfaces under all circumstances.

5) Construction in Occupied Buildings

a) When building occupants are present during construction projects, additional safeguards must be implemented to eliminate exposures and complaints. Dusts and other particulates from demolition, sanding and other construction activities must be controlled by containment and negative air ventilation systems. Similar controls must be utilized for similar odorous activities including, but not limited to, carpet adhesive, painting, welding and coatings.

b) Control of dusts and other particulates in both occupied and unoccupied buildings will also prevent the contamination of HVAC systems. The contractor must ensure that the HVAC system in each building is turned off and that the system is sealed off to prevent contamination. If an HVAC system is unprotected and contaminated by construction/demolition materials, the contractor will be held responsible for the cost of the system and other related cleaning.

c) Negative air ventilation systems shall have appropriate filtration and be exhausted outside of the building.

d) Occupant complaints related to dust and other particulates and odors during construction may interrupt the project schedule. Projects may only continue once problems have been resolved.

6) Construction in Research Facilities

a) The purpose of this section is to ensure that all hazardous materials impacted by laboratory renovation are handled and disposed of safely and in accordance with all federal, state and local laws and regulations. The University has set the following responsibilities for renovations taking place in research facilities:

- Departments/Researchers
  (a) Laboratories must be decommissioned in accordance with the Brown University "Closeout Policy for Research Laboratories and Research Support Areas" located at the following
  URL: http://www.brown.edu/Administration/EHS/restricted/lab_closeout.pdf
- Project Managers shall:
  (a) Perform a survey to identify hazardous building materials (e.g., asbestos, PCB light ballasts, mercury containing devices, sink traps, etc.).
  (b) Coordinate abatement contractors and provide oversight of abatement operations.
  (c) Notify contractors of all hazardous materials or conditions present in their work area.
  (d) Keep departments, researchers & EHS informed regarding construction schedule.
  (e) Inform EHS regarding ALL work that will interrupt critical research services such as ventilation (supply or exhaust), emergency eye wash/showers, research equipment cooling loops, fire alarm systems, electrical systems for certain research equipment, fire detection and steam. This includes ensuring that affected fume hoods receive the necessary postings to alert end users of the shut down schedule.
  (f) Ensure that FM Operations and EHS are kept informed of any planned removal or installation of chemical fume hoods.
  (g) Ensure that all modified or newly installed fume hoods have been ASHRAE 110 Certified and forward the test results to EHS.
- Environmental Health & Safety shall:
  (a) Will remove hazardous materials when notified.
  (b) Will assist with communication and notification during ventilation and other building system interruptions. Request for EHS assistance should be made at least 24-hours before the proposed shut down.
- Contractors shall:
  (a) Ensure all decommissioning work, closure and abatement (to be done by others) has been completed prior to the start of construction.
  (b) Comply with all of the requirements of this program as well as all federal, state and local laws and regulations.
  (c) Develop a site safety plan for their employees.
  (d) Stop work and report any hidden hazardous conditions or materials to the Project Manager immediately upon discovery.

b) Biological, Chemical and Radiological Hazards

- Some Brown University operations involve the use of biological, chemical or radioactive materials that can be hazardous if not handled safely. Areas where work with biological, chemical or radioactive materials is being performed will be marked with appropriate signs. Do not enter these areas or handle biological, chemical or radioactive material unless it is part of the contracted work and the contractor is specifically trained to do so.

C Occupational Health & Safety Procedures at Brown

1) Hazard Communication / Right-To-Know

a) The Contractor shall ensure compliance with OSHA's Hazard Communication Standard and the Rhode Island Right-To-Know Act.

b) Specifically the Contractor is responsible for:
- Ensuring all employees and sub-contractor employees receive initial and annual Hazard Communication or Right-To-Know training about the chemical hazards present in their workplace.
- Ensuring that Material Safety Data Sheets (MSDS) are on-site and available for all hazardous substances that are used to complete the project scope of work.
  (a) Contractors must be able to produce MSDS's immediately upon request.
- Ensuring that the Project Manager is informed of the use of hazardous substances in occupied buildings (see Construction in Occupied Buildings section of this program)
- Ensuring that all containers are inspected periodically and labeled in accordance with all applicable regulations.
- Using flammable substances (i.e., oil paints and solvents) with extreme caution, ensuring that they are stored in approved flammable storage cabinets or containers.
- Removing all hazardous substances that brought on-site when work with these substances is complete (see Environmental Management at Brown section of this program).

c) The Contractor must also comply with all of the OSHA regulations regarding multi-employer workplaces.

d) The Contractor may request and review Material Safety Data Sheets for any hazardous substance that is encountered on University property during the performance of its work by contacting EHS at 401-863-3353.

2) Personal Protective Equipment

a) Contractors are responsible for following the requirements of OSHA and providing appropriate personal protective equipment (PPE) for their employees. In doing so, it is recommended that the Contractor perform a job hazard analysis (JHA) for each task. In certain situations the Project Manager may request a copy of the Contractors JHA.

b) Personal protective equipment (PPE) is designed to provide additional worker protection despite efforts to eliminate the hazard through engineering and administrative controls. The following is a listing of common types of PPE, which are used in the construction industry. However, this is not a complete list and other forms of PPE should be used as appropriate when working at the University.

c) Head Protection
- Hard hats are always required on multi-trade jobsites due to the risk of injury from other trade operations.
- All hard hats must meet the most current hard hat requirements as set forth by ANSI.
- Daily inspections must be made on all hard hats, including the shell and suspension system.
- A hard hat is not to be modified or painted unless the manufacturer's instructions allow it.

- A protective hair covering (hair net) may also be prudent for individuals who have long hair. A hair net could be used to protect against chemical contamination of hair, entanglement of hair in machinery or equipment, and preventing hair from interfering with the workers vision or respiratory device.

d) Eye and Face Protection
- Eye and face protection can be used to protect the worker from airborne dusts, mists and particles; glare; splashing liquids; ultraviolet radiation or a combination of these hazards. Safety glasses, safety goggles and face shields are all types of eye and face protection with specific emphasis on certain hazards.
  (a) Safety glasses are used for impact hazards, which include, but are not limited to grinding, cutting and equipment operation.
  (b) Safety goggles are used for splash and particulate hazards, which include, but are not limited to chemical application, sanding and misting.
  (c) Face shields are only to be used in conjunction with safety glasses or goggles. Use of a face shield alone is unacceptable. Face shields are to be used as additional protection for the workers face and will protect the worker from direct impact and splashes.
- If lasers are used during construction or engineering of a project, special eye protection may be necessary. Please refer to the laser safety section of this program, the equipment manufacturer, or contact EHS at 401-863-3353.

e) Hearing Protection
- Contractors are required to provide hearing protection training and medical monitoring for employees who are working in areas exceeding the OSHA 85 decibel action level. A hearing protective device with an adequate noise reduction rating is required by OSHA when workers are exposed to sound levels exceeding 90 decibels during their work shift. Activities frequently exceeding the OSHA threshold are jack hammering, grinding operations, table saw operation, hammering operations and fire alarm testing.

f) Hand Protection
- Hand protection is required by OSHA when workers are exposed to hazards such as those from skin absorption of harmful substances, severe cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns, and harmful temperature extremes.
- Hand protection varies based on the type of hazard. There is a large variety of protective gloves used to protect a worker from chemical hazards. A worker must be responsible for being aware of the chemical that they are working with and whether or not the glove they are using is appropriate. A worker should refer to the product's MSDS to determine the appropriate glove to be used for the task.

g) Protective Clothing
- All contractors involved in construction activities must wear, at minimum, Level D personal protective equipment. Level D PPE includes pants, long sleeve shirt, safety boots or shoes, safety glasses or goggles and a hard hat. Gloves or a face shield would be an example of optional Level D PPE.
- A safety vest may also be required if a worker is exposed or potentially exposed to vehicular traffic. The safety vest should be reflective and brightly colored so as to alert traffic to the position of the worker during both day and evening operations.

h) Foot Protection
- Safety boots or shoes shall be designed to protect the workers feet from hazardous substances, compression, crushing, or puncture hazards. Safety footwear may also provide electrical protection to the worker if necessary for the tasks being performed.
- Safety boots or shoes used on construction sites must meet all of the requirements in both OSHA 29 CFR 1926.96 Occupational Foot Protection and OSHA 29 CFR 1910.136 Occupational Foot Protection.

i) Respiratory Protection
- Employees who respond to emergency situations, or work with or around hazardous substances, hazardous waste or any other hazardous environment may need to use respiratory protection in cases where engineering controls cannot provide adequate protection against exposures. The proper use of respiratory protection can reduce, minimize or eliminate the risk of injury or illness due to hazardous chemical exposure.
- Contractors are encouraged to utilize respiratory protection in areas where a potential exposure may exist and other engineering controls are not feasible. However, contractor shall not wear respirators in areas that do not present a potential exposure.

3) Hot Work

a) All Hot Work in any University building must be permitted by Brown University. Contractors must comply with the all of the requirements of the Brown University Hot Work Program. A copy of this program is located at the following URL. http://www.brown.edu/Administration/EHS/public/hot_work.pdf
- Obtain a permit from the Brown University Fire Safety Office (401-863-3462) for each separate work activity and ensure that all conditions of the permit are met at all times. A request for a permit must be submitted to the Fire Safety Office a minimum of forty-eight (48) hours prior to the start of any hot work.
- Blanket Hot Work Permits may be issued for longer duration projects if approved by the University Fire Safety Office. If a blanket hot work permit is issued, the Contractor will be responsible for issuing daily permits for all hot work performed as part of the project.
- The Contractor must also coordinate with Facilities Management Electrical Division for fire alarm impairments in the area of the hot work to avoid false alarms.

4) Confined Spaces

a) Contractors are responsible for following the requirements of OSHA's Confined Space Standard(s) and University protocols described below, when entering confined spaces or permit-required confined spaces. Contractor requirements for confined space entry include.
- The Contractor is responsible for developing, implementing and maintaining their own Confined Space Entry Program, including training for staff, use of an entry permit and provisions for emergency rescue as it applies to the work of the contract.
- If during the course of work, the Contractor encounters a confined space that has not been previously identified by the University, it must immediately alert the Project Manager of the existence of such a space and delay entry until Facilities Management has examined the space.
- When both University staff and Contractor staff are working in or near confined spaces, the Contractor shall coordinate with the affected University staff before entry occurs.
- Advance notification of an entry is always required. Whether entering a confined space with a Brown employee or not, the Contractor's entry attendant must always first inform

Brown University Project Manager and/or Service Response at 401-863-7800 before entering a confined space.

- The Contractor shall provide the Project Manager and/or Service Response with:
  (a) The exact location of the confined space including its unique Brown identifier.
  (b) The time of entry and approximate entry duration.
  (c) The names of authorized attendants and entrants.
  (d) The time the entry is complete and that all entrants are safely out.
  (e) A description of any hazards confronted or created in the space.
- The Contractor must ensure that adequate work areas around all confined space entries are provided. Contractors must follow the requirements of the Site Safety & Security section of this program.

b) Facilities Management's Computer Aided Design (CAD) Office is responsible for maintaining and updating an inventory of University owned confined spaces. Project Managers are responsible for ensuring that the inventory is up-to-date with any change to, modification to, addition of or deletion of a confined space.

c) Brown University has developed and implemented a Confined Space Program (including a Confined Space Entry Permit) to protect all University employees who are required to enter confined spaces. Contractors should develop their own programs/permits to meet their work requirements. However, all entries made by University staff must be performed while using the Brown University Confined Space Entry Permit.

5) Fall Protection

a) Contractors are responsible for following the requirements of OSHA's Fall Protection Standard(s) and University protocols described below, when working on elevated surfaces.

b) The OSHA Standard "29 CFR Subpart M – Fall Protection" identifies areas or activities where fall protection is needed. These include, but are not limited to, ramps, runways, and other walkways; excavations; hoist areas; holes; formwork and reinforcing steel; leading edge work; unprotected sides and edges; overhand bricklaying and related work; roofing work; precast concrete erection; wall openings; residential construction; and other walking/working surfaces. The rule sets a uniform threshold height of 6 feet (1.8 meters), thereby providing consistent protection. This means that construction employers must protect their employees from fall hazards and falling objects whenever an affected employee is 6 feet (1.8 meters) or more above a lower level. Protection must also be provided for construction workers who are exposed to the hazard of falling into dangerous equipment.

c) Contractors shall select fall protection measures compatible with the type of work being performed. Fall protection generally can be provided through the use of guardrail systems, safety net systems, personal fall arrest systems, positioning device systems and warning line systems, among others.

6) Scaffolding

a) Contractors are responsible for following the requirements of OSHA's Scaffolding Standard(s) and University protocols described below, when working on/with scaffolding.
- Contractors shall utilize qualified persons to design scaffolding and erect/move/dismantle scaffolding under the supervision of a competent person.
  (a) Hiring a professional engineer for the design of complex projects may be necessary.

- Contractors are responsible for providing adequate anchorage, foundation, bracing, pinning, support, access, working surface, fall protection and training for employees working on suspended scaffolding.
- Contractors are required to provide fall protection for employees erecting or dismantling supported scaffolds where the installation and use of such protection is feasible and does not create a greater hazard.
  (a) Any Contractor who believes that providing fall protection for their employees creates a greater hazard or is infeasible shall review the erection or dismantling plan with EHS prior to beginning work.

7) Excavation

a) Prior to any excavation the contractor is responsible for notification of all applicable utility companies that excavation work is being performed. The Contractor should contact Dig Safe at 1-888-DIG-SAFE and any other utility that cannot be contacted by calling Dig Safe. The contractor is also responsible for contacting the Facilities Management Computer Aided Design Office at 401-863-9144 and the Project Manager for specific Brown University owned utility information prior to beginning any excavation.
   - Contractors must note that contacting Dig Safe will not cover work on private (University) property. Dig Safe will not locate University owned utilities except when they interface with other utilities.
   - Contractors must provide Dig Safe confirmation numbers to the Project Manager so that the number can be forwarded to Service Response and other University departments.
   - Contractors are responsible for updating the Dig Safe number every 30 days and informing the appropriate federal, state and local jurisdictions including the Project Manager of the update.
   - Contractors must verify the location of any marked utility or as-built information either prior to or during excavation.

b) Contractors must comply with all OSHA standards and the following University requirements with regard to all excavation operations at Brown University.
   - The Contractor must ensure that adequate work areas around all excavations are provided.
   - Contractors must follow the requirements of the Site Safety & Security and Soil Management sections of this program.
   - The Contractor is responsible for submitting excavation plans to the Project Manager prior to any excavation related activities.
   - The Contractor will notify the Project Manager prior to any utility shutdown both public and private. The contractor must also notify the Project Manager immediately of any unplanned shutdown or interference with any site utility.
   - The Contractor will notify the Project Manager of any overtime hours necessary to complete the work.
   - The Contractor is responsible for routine inspections of all excavation equipment. The inspection is to include safety features like back-up warning sounds and appropriate lighting.
   - The Contractor is responsible for ensuring that equipment operators carry the required (valid) licenses and have the necessary training to operate the equipment on site.
   - If there is potential for a hazardous atmosphere in an excavation, contractors must follow all OSHA requirements to ensure workers are not exposed to hazardous substances and/or an oxygen deficient environment.
   - If dewatering is necessary for an excavation, the contractor must contact EHS and the Project Manager prior to excavation for environmental compliance assistance.

- While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.
- When working around City and/or University owned trees the contractor must take special precautions not to harm the tree in any way. The contractor must notify the City of Providence Parks Department Forestry Division at 401-785-9450, ext. 254 if the tree is city owned and/or Brown University's Grounds Superintendent at 401-863-7825 if the tree is University owned.

8) Crane & Rigging Operations

a) Contractors must comply with all OSHA standards and the following University requirements with regard to all crane and/or rigging operations at Brown University:
- The Contractor is responsible for submitting rigging plans to the Project Manager prior to any related activities.
  (a) If work is being performed in a public roadway, the contractor is responsible for contacting the local authorities and making all arrangements for police details and/or street closure permits as appropriate.
  (b) If work is being performed in a high traffic area, all workers must conform to OSHA standards for exposure to vehicular traffic.
- Each crane, rigging or hoist used as part of a Brown University project must have an annual inspection performed by a certified testing agency. Documentation, including a logbook for the crane used, must be available on-site upon request.
- All operators must possess a valid Rhode Island hoisting license. Documentation of this license shall be available on-site upon request. Under no circumstance shall a non-licensed operator hoist loads. The crane operator is responsible for daily recordkeeping, monitoring and equipment inspections.
- The operator is responsible for the proper placement of the crane in relationship to the load to be handled and the landing area so as to obtain the best-rated lift capacity. It is also important to ensure the installation and maintenance of the crane swing radius protection.
- Scale pans and other approved hoisting mechanisms shall be used to hoist materials. Only items specifically designed to be hoisted by a crane should be hoisted. Fifty-five (55) gallon drums should not be directly hoisted by a crane or other means.
- The Contractor must ensure that adequate work areas around all crane or rigging operations are provided. Contractors must follow the requirements of the Site Safety & Security section of this program.

9) Ladder Safety

a) A means of access is required anytime a Contractor needs to access a surface that is 19 inches higher or lower than the surface they are standing or working on. On a construction site, access is most commonly gained through the use of a ladder. The following are University minimum guidelines for safe use of a ladder.
- Ladders are to be inspected on a regular basis.
- Ladders that are deemed unsafe must be removed from service immediately.
- For fewer than 25 people working on an elevated surface, generally only one ladder is required unless there is simultaneous traffic in both directions.
- Ladders shall be maintained so that they remain free of all slipping hazards, such as grease and oils.
- Ladders must be setup on level and stable ground.
- Ladders must be tied off at all times.

- An extension ladder slope shall always be 4’ of height to 1’ away from building.
- The top of a ladder must always extend 3 feet higher than the roof or work platform it is resting upon, unless it is equipped with a secure grab rail.
- While on a ladder, workers must face the ladder and maintain at least three-points of contact with the ladder at all times. No awkward or excessively heavy loads are to be carried on a ladder by workers.
- No work shall be performed until all ladders are properly secured.
- Barricades should be setup to direct pedestrian traffic away from a ladder.
- The areas around the top and bottom of the ladder must remain clear of debris and other objects.
- All ladders must be removed at the end of the work shift and properly secured to prevent unauthorized access to elevated surfaces.

10) Control of Hazardous Energy - Lockout/Tagout

a) The Contractor is responsible for developing, implementing and maintaining their Lockout/Tagout Program in accordance with OSHA standards as it applies to the work of the contract. The Contractor shall ensure that its Lockout/Tagout Program meets all of the requirements of OSHA’s multi-employer workplace requirements.
   - If the Contractor intends to service or maintain equipment that could potentially hurt someone if unexpectedly started, the Contractor is responsible for informing the Project Manager of the lockout/tagout procedures that are intended to occur.
   - Brown University Facilities Management is responsible for all shut down and start up of utility systems for all University properties.
   - The Contractor will maintain a log of all machines and equipment that are locked out and/or tagged out during the performance of the work of this contract. This log shall identify the equipment that was worked on, the date that work was performed, and the name of the individual performing the work. The Contractor must provide this log to the Project Manager upon request.
   - As part of Brown’s Lockout/Tagout Program, locks and tags are used to control the start-up of equipment that is being serviced or maintained by its employees. At no time shall the Contractor or its employees override any locks or tags that they encounter during the performance of their work.

11) General Electrical Safety

a) The following general electrical safety requirements must be followed by contractors.
   - Secure electrical work areas in accordance with the Site Safety & Security section of this program.
   - Only qualified electricians are permitted to work on electrical systems and equipment that uses or controls electrical power.
   - Ground Fault Circuit Interrupters (GFCI’s) are to be used with any electric equipment used in wet or potentially wet environment. GFCI’s can be either in the form of a “pigtail” or hard wired to the buildings electrical system.
   - Should a circuit breaker or other protective device "trip," ensure that a qualified electrician checks the circuit and equipment and corrects problems before resetting the breaker.
   - Defective or modified extension cords should not be used.
   - Do not operate electrical tools or equipment in areas where potentially flammable dusts, vapors or liquids are present, unless specifically approved for the location.

- Report hazards (lack of protective guards or covers, damaged equipment, etc.) to the Project Manager immediately.
- Do not leave electrical boxes, switchgear, cabinets or electrical rooms open when not directly attended. Insulate energized parts when covers have been removed or doors are open. Use of cardboard, plywood, or other flammable materials to cover energized circuits is prohibited.

12) Compressed Gas Cylinders

a) Compressed gases can pose a severe hazard to Brown's faculty, staff, students and the public. Contractors must follow all OSHA, Compressed Gas Association (CGA) and applicable NFPA guidelines for compressed gas storage and use. Therefore, the following measures must be taken:
   - Close cylinder valves and replace valve covers/caps when a cylinder is not actively in use, when cylinders are empty and/or when being moved.
   - Secure compressed gas cylinders in an upright position in a welding cart or to a solid object (using chains, straps, or a rigid retaining bar). Secure compressed gas cylinders on an approved carrier while being transported.
   - Keep cylinders at a safe distance or shielded from welding or cutting operations. Do not place cylinders where they can contact an electrical circuit.
   - Keep all regulators in proper working order and a wrench in position on the acetylene valves when in use. If not manifolded together, separate oxygen and flammable gas cylinders by 20 feet or a 5-foot high fireproof barrier.
   - If a leak develops from a cylinder and it cannot be immediately corrected, evacuate the area and contact Public Safety at 401-863-4111.
   - Use only industry approved spark igniters to light torches.
   - Cylinders must not be taken into or stored in confined spaces, including gang boxes and office/storage trailers.
   - Do not route hoses and regulators through unventilated or closed containers or areas.
   - Do not leave partially filled or empty cylinders on campus. Always remove them from the site promptly.

b) Acetylene is an unstable gas and has compatibility issues with other materials including copper. No copper tubing should be used and special low copper regulators are required. It is recommended that all acetylene tanks have backflow protectors to prevent contamination. Acetylene tanks should never be tipped since there is acetone stored in the bottom of every cylinder.

13) Pneumatic Tools & Compressed Air Systems

a) Pneumatic tools are powered by compressed air. Compressed air can create a hazardous condition if the proper precautions are not taken. Contractor must comply with the following.
   - All pneumatic tool operators must have and use appropriate PPE.
   - A tool retainer shall be installed on each piece of equipment which, without such retainer, may eject the tool.
   - All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, which operate at more than 100 p.s.i. pressure at the tool, shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.
   - Pneumatic tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.

- The tool/hose/component manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.
- The use of hoses for hoisting or lowering tools shall not be permitted.
- All hoses exceeding ½-inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.
- Protective screens shall be set up to protect nearby workers from being struck by flying fragments associated with the operation of a pneumatic tool.
- Compressed air guns should never be pointed toward anyone. The user should never "dead-end" it against themselves or anyone else.
- Before any air line connection is made or removed, always turn the air supply off. Use the valve to turn off the air and never kink the hose as a short cut. Kinking a hose may damage or rupture the air hose.
- Protect air hoses from damage. Keep hoses clear of pedestrian and vehicle traffic and do not drag hoses around sharp corners.
- Be sure to use properly rated and sized air hoses and fittings to keep air pressure even throughout the entire system.
- Keep all connections clean. Clear any dirt/debris from the nipple before connecting the hose.
- Maintain a clean, dry, regulated source of air to operate tools at peak performance.

14) Powder-Actuated Tools

a) Powder-actuated tools can pose hazards to Brown's faculty, staff, students, property and the public. Such tools are therefore not permitted in occupied Brown buildings without the approval of the Brown University Project Manager. If a powder-actuated tool is allowed on campus, it must be operated in accordance with OSHA standards. In addition:
   - Contractor's who operate powder-actuated tools must be properly trained in their use and carry a valid operator's card provided by the equipment manufacturer.
   - Each powder-actuated tool must be stored in its own locked container when not being used and remain unloaded until it is to be used immediately.
   - A sign at least 7 inches by 10 inches with bold face type reading "Powder-Actuated Tool in Use" must be conspicuously posted when the tool is being used.
   - All powder-actuated tool operators must have and use appropriate PPE.
   - Powder-actuated tools should not be used in an explosive or flammable atmosphere.
   - Before using the powder-actuated tool, the worker should inspect it to determine that it is clean, that all moving parts operate freely and that the barrel is free from obstructions.
   - A powder-actuated tool should never be pointed at anybody.
   - Hands should be kept clear of the barrel end. To prevent the powder-actuated tool from firing accidentally, two separate motions are required for firing: one to bring the tool into position, and another to pull the trigger. The tools must not be able to operate until they are pressed against the work surface with a force of at least 5 pounds greater than the total weight of the tool.
   - If a powder-actuated tool misfires, the employee should wait at least 30 seconds, and then try firing it again. If it still will not fire, the user should wait another 30 seconds so that the faulty cartridge is less likely to explode, than carefully remove the load. The bad cartridge should be put in water.
   - The muzzle end of the powder-actuated tool must have a protective shield or guard centered perpendicularly on the barrel to confine any flying fragments or particles that might otherwise create a hazard when the tool is fired. The tool must be designed so that it will not fire unless it has this kind of safety device.

- All powder-actuated tools must be designed for varying powder charges so that the user can select a powder level necessary to do the work without excessive force.
- If a powder-actuated tool develops a defect during use it should be tagged and taken out of service immediately until it is properly repaired.

15) Laser Use Operations

a) Brown University allows the use of equipment with visible light beam Class 1 and 2 lasers on campus projects without special permission from EHS. However, if a project requires the use of equipment with a Class 3 or 4 laser, the Contractor will be required to contact EHS at 401-863-3353 and obtain written permission prior to using the equipment on University property. During laser operation the Contractor is responsible for ensuring all OSHA standards are followed.

16) Field Radiography Operations

a) The use of radiography is a routine quality assurance procedure for welding in the construction industry. The energy source used is a high activity gamma ray source similar to X-rays. Due to the public perception of radiation risk, and Brown University's policy of keeping exposure to radiation as low as reasonably achievable, the following additional requirements are made:

b) Project Managers shall:
- Notify EHS of the date, time, and location of any radiography work on University property at least 24 hours in advance. The Project Manager shall also provide the name of the radiography company performing the work.
- Ensure that the Radiographer is licensed in, or has filed for and received a reciprocity agreement from, the State of Rhode Island Radiation Control Agency.
- Notify building occupants prior to starting radiography work. This is particularly important when occupied spaces are involved or nearby. The Office of Residential Life should be involved with coordinating radiography work in residence halls.
- Coordinate with Brown Public Safety to have an officer on site for the duration of the work if their presence is required to ensure control of access to the work area.

c) Radiographers shall:
- Ensure continuous direct visual surveillance of the operation to protect against unauthorized entry into a radiation area during radiographic operations.
- Conspicuously post signs in all areas where radiography is performed.
- Maintain a current radiography license, or approved reciprocity agreement from the State of Rhode Island.

17) Radioactive Containing Devices For Life Safety

a) Self-luminous (Tritium) Exit Signs:
- A self-luminous (or self-powered) tritium exit sign is a non-electrical device that uses radioactive tritium gas to produce light. The signs contain glass tubes, internally coated with a phosphor, and filled with tritium gas. The radioactive gas causes the phosphor coating in the glass tubes to continuously produce light.
- The production and distribution of self-luminous signs is licensed by the U.S. Nuclear Regulatory Commission because they contain significant amounts of radioactive material.

Brown University is responsible for ensuring compliance with state and federal regulations and, to do so, must be aware location of these signs.

(a) Tritium exit signs cannot be installed, or replaced in kind, on Brown University properties unless approved in writing by EHS. Authorization to use these signs will only be considered when traditional lighting fixtures are extraordinarily difficult to install.
(b) If discovered intact during renovation projects, these signs must be collected by EHS, at the time of their removal, for proper disposal. The cost of disposal will be charged to the project.
(c) If a sign is damaged or found damaged during construction, immediately follow the instructions in the Emergency Procedures section of this program.

b) Ionizing Smoke Detectors:

- The production and distribution of smoke detectors using radioactive material is licensed by the U.S. Nuclear Regulatory Commission. In Rhode Island, the Radiation Control Agency continues the regulatory supervision of possession and use of these items if they contain a certain type or amount of radioactive material. Brown University is responsible for ensuring compliance with these state and federal regulations and must be aware of the presence and location of smoke detectors that require further regulatory supervision.
  (a) If the smoke detector contains <u>less than</u> 1 micro curie of Americium 241, (Am-214) there are no regulatory requirements for their possession, use, or disposal.
  (b) Smoke detectors that contain a radioactive material <u>other than</u> Am-241, or Am-241 in quantities <u>greater than</u> 1 micro curie, cannot be installed, or replaced in kind, on Brown University properties unless approved in writing by EHS.
  (c) If smoke detectors are installed or removed during renovation or construction projects, EHS must be notified for evaluation and approval of their intended use, or to make a determination of proper disposal methods if they are removed.
  (d) If a smoke detector is damaged or found damaged during construction or renovation work, EHS must be notified.

D Environmental Management Procedures at Brown

1) The Project Environmental Checklist

a) EHS developed the Project Environmental Checklist (PEC) to assist Project Managers and Contractors in complying with the requirements of the Environmental Management Procedures section of this program. The PEC is located in Appendix B of this program.

b) The PEC must be completed by the Project Manager or Contractor for each project and submitted to EHS prior to the start of work. If changes in the work affect the status of the PEC, the Project Manager is responsible for updating EHS as changes are made.

c) The PEC can be submitted electronically to Henry_Huppert@brown.edu or submitted through the campus mail at Box 1914 (attention Environmental Compliance Officer).

2) Air Emissions

a) Air Operating Permit
- Brown University has an Air Operating Permit (AOP) issued by the RIDEM (Permit Number RI-09-06(R1)). A copy of this permit can be found at http://www.dem.ri.gov/programs/benviron/air/opperms/brown.pdf
- Any modification, addition or removal of any fuel burning equipment must be coordinated with EHS to ensure proper modification of the AOP.
- Any maintenance or repairs to fuel burning equipment that could result in a change in maximum heat input value or overall emissions (e.g., modification or installation to burners, exhaust stacks, generators or fuel conversions) must be reported to EHS immediately.
- Any conditions discovered which could have resulted in an increase in air pollutant emissions must be reported to EHS immediately.

b) Emergency Generators
- If an emergency generator is added or removed from campus, the AOP must be modified to reflect the change and specific permits must be acquired from RIDEM prior to purchase and installation of new units.
- If the project will include installing an emergency generator with an input heat duty of less than 350,000 BTU/Hr, or in the case of internal combustion engines, is less than 50 HP then EHS must be provided with the location and input duty of the generator so it can be added to list of insignificant sources in the AOP.
- If the project will include installing an emergency generator with an input heat duty of 350,000 BTU/Hr or more, or in the case of internal combustion engines, is 50 HP or larger, then Brown is required to submit an Application for a General Permit for an Emergency Generator and the unit must be added to the AOP. A copy of the application can be found at: http://www.dem.ri.gov/programs/benviron/air/pdf/gpegapp.pdf Contractors supplying equipment must work with EHS to complete the application. Please note that the unit cannot be installed until permit approval is received from the RIDEM.

c) Boilers and Other Fuel Burning Equipment
- If the project will include installing any fuel burning equipment with an input heat duty of less than one million BTU/Hr then EHS must be provided with the location and input duty of the unit so it can be added to list of insignificant sources in the AOP.

- If the project will include installing any fuel burning equipment with an input heat duty of greater than or equal to one million BTU/Hr, then the unit must be added to the University's Air Operating Permit. Provide EHS with location and detailed specifications for the proposed unit.
- If the project will include installing any fuel burning equipment with an input heat duty of more than 10 million BTU/Hr for gas-fired equipment or 5 million BTU/hr for oil fired equipment, then Brown is required to submit an Application for Approval of Plans to Construct, Install, or Modify Fuel Burning Equipment and the unit must be added to the University's Air Operating Permit. A copy of the application can be found at: http://www.dem.ri.gov/programs/benviron/air/pdf/fuelburn.pdf. Work with contractor supplying equipment and EHS to complete the application. Please note that the unit cannot be purchased until permit approval is received from the RIDEM. Permit approval may take at least 90 days.

d) Other Air Emissions
- If the project will include installing any equipment that has the potential to emit any of the 223 Air Toxics by an amount greater than the Minimum Quantity for that contaminant specified in Regulation 22, consult with EHS immediately as "No person shall construct, install, or modify or cause construction, installation, or modification of any stationary source which has the potential to increase emissions of a listed toxic air contaminant by an amount greater than the Minimum Quantity for that contaminant specified in Regulation 22 without first obtaining an approved permit to construct, install or modify from RIDEM." A copy of the regulation and the list of Air Toxics and Minimum Quantities can be found at the following URL (beginning on Page 29): http://www.dem.ri.gov/pubs/regs/regs/air/air22_08.pdf.

e) CFC Containing Units
- Contractors shall immediately notify EHS whenever they become aware of any unintentional or intentional release of CFCs above de-minimis levels as established by EPA regulators.
- Contractors shall provide the following documentation to the Project Manager and EHS:
  (a) EPA certifications for any reclaimers to which CFC products evacuated from Brown systems are to be sent.
  (b) Certifications for any CFC recycle/recovery equipment to be used at Brown.
  (c) Technician Certifications who will work on Brown University systems.
  (d) Service records for all units containing greater than 50 pounds of refrigerant. Records must include the date and type of service and the type and quantity of refrigerant added.
- Contractors shall immediately notify and provide documentation to the Project Manager and EHS whenever:
  (a) A leak rate equals or exceeds 35% per year for commercial/industrial processes.
  (b) A leak rate equals or exceeds 15% per year for comfort cooling processes.
  (c) A release occurs of >100 pounds in a 24 hour period for CFC-12, CFC-113 and R-500.

f) Halon
- Service providers shall immediately notify the Project Manager whenever it becomes aware of any unintentional or intentional release of halon.

3) Asbestos Containing Materials

a) The Contractor shall not disturb, damage or otherwise handle any suspect asbestos containing material. It is recommended that the following suspect materials be assumed to contain asbestos until tested and proven otherwise:

Suspect Asbestos Containing Materials		
Cement Pipes	High Temperature Gaskets	Electrical Wiring Insulation
Cement Wallboard	Lab Hoods/Benches/Gloves	Chalkboards
Cement Wallboard	Fire Blankets/Curtains/Doors	Roofing Shingles and Felt
Flooring Backing	Elevator Equipment Panels	Base Flashing
Construction Mastics	Elevator Brake Shoes	Thermal Paper Products
Acoustical Plaster	HVAC Duct Insulation	Caulking/Putties
Decorative Plaster	Boiler Insulation	Adhesives
Textured Paints/Coatings	Breeching Insulation	Wallboard
Ceiling Tiles/Lay-in Panels	Pipe Insulation	Joint Compound
Spray-applied Insulation	Cooling Towers	Vinyl Wall Coverings
Blown-in Insulation	Electrical Cloth	Asphalt Floor Tile
Fireproofing Materials	Heating and Electrical Ducts	Vinyl Sheet Flooring
Taping Compounds	Electrical Panel Partitions	Vinyl Floor Tile
Floor or Wall Penetration Packing Materials	Ductwork Flexible Fabric Connectors	Spackling Compounds

b) The Contractor shall not sweep, dust, vacuum, or mop dust or debris that is the product of a suspect asbestos containing material. The Contractor shall also not pick up or throw away any suspect asbestos-containing waste or trash. If a material that is suspected to be asbestos containing is disturbed and becomes airborne, the Contractor shall immediately notify the Project Manager and Service Response at 401-863-7800.

c) If it is part of the Contractor's work, stripping of floor finishes shall be done using low abrasion pads at speeds lower than 300 rpm and wet methods shall be used. The Contractor shall take care not to over strip floors and shall stop stripping immediately upon removal of the old surface coat. Sanding of suspect or asbestos containing flooring material is strictly prohibited.

d) Any suspect asbestos containing material that is observed by the Contractor to be crushed, ripped, broken or in any way damaged should be reported to the Project Manager immediately.

e) Contractors must immediately convey to the Brown University Project Manager any information they newly discovered about the presence, location and quantity of asbestos containing or potentially asbestos containing materials.

f) Asbestos containing building materials should not be entombed or abandoned as a solution to project cost. The material may be forgotten and overlooked in future renovations causing a potential for future exposures. Examples of entombing includes but is not limited to installing carpet over vinyl asbestos tiles, installing fiberglass pipe insulation over asbestos pipe insulation. All exceptions to this policy must be approved by the Director of EHS. It is the policy of Brown University that no asbestos containing building materials may be used in new construction or renovations on University property.

g) Asbestos Abatement Activity Requirements
- Before work is started for planned asbestos abatement projects, Brown University will have determined the presence, location and quantity of asbestos-containing materials that would be impacted by the work of the contract. The Brown University Project Manager will provide a current asbestos inspection report or abatement plan to the contractor which is consistent with the scope of work. Contractors should coordinate with the Project Manager for specific requirements for asbestos abatement work. EHS should be consulted as needed by the Project Manager.
- Brown University has specific requirements during all asbestos abatements, including but not limited to:
  (a) Contractors & asbestos abatement contractors must review and be familiar with the asbestos inspection report and asbestos abatement plans.
  (b) The asbestos abatement contractor must:
    (i) Perform all OSHA required personnel air monitoring.
    (ii) Provide original waste shipment records to EHS for recordkeeping and copies to the Brown University Project Manager.
    (iii) Provide copies of waste shipment records to the state.
- Under the direction of the Brown University Project Manager, the Industrial Hygiene consultant shall:
  (a) Perform an asbestos inspection, take samples as appropriate and prepare a report for any affected area within the defined scope of work.
  (b) Prepare and submit the asbestos abatement plan to RIDOH.
  (c) Perform baseline air monitoring as required.
  (d) Provide air monitoring during every work shift where abatement is performed.
  (e) Perform visual inspections and clearance air samples at the completion of abatement activities.
  (f) Authorize re-entry once acceptable air clearance samples have been received.
  (g) Provide all analytical results, inspection reports, abatement plans and air clearance results to EHS and the Project Manager.
  (h) Provide air clearance results to RIDOH.

h) Brown University uses a select group of approved industrial hygiene consultants that perform services for the University. For a complete listing of approved industrial hygiene consultants for Brown University see Appendix A of this program. Any other company must receive specific approval by EHS, Purchasing & Facilities Management.

4) Lead Containing Materials

a) Unless the Brown University Project Manager provides a specific lead-paint inspection, Contractors should assume that any painted surface they come in contact with is coated with lead-based paint in buildings older than 1978. Therefore, Contractors should not perform any intrusive, dust-generating work on painted surfaces (e.g., drilling, cutting, brazing, scraping, demolition), unless the surface has confirmed to be non-lead or unless such work is part of the contracted work and they are specifically trained to do so.

b) The Project Manager is responsible to ensure that proper notification of lead paint abatement will be performed. There are three types of notification that can occur:
- When performing any interior work in an occupied building, the Project Manager must ensure that Service Response communicates the scope of the work to the building occupants.

- When performing any exterior work, the Project Manager must work with Public Affairs and University Relations (PAUR) to communicate to external neighbors in compliance with RIDEM Regulation 24. A sample letter for external neighbors is included in the Lead Exposure Control Program located at the following URL: http://brown.edu/Administration/EHS/restricted/lead_exposure_control.pdf. In addition, the Project Manager must also work with Service Response to communicate the scope of the work to the building occupants.
- When working inside or outside any Auxiliary Housing or day care facilities, the Project Manager must provide EPA's document entitled "*Renovate Right: Important Lead Hazard Information for Families, Child Care Providers and Schools*" located at the following URL: http://www.epa.gov/lead/pubs/renovaterightbrochure.pdf. This document must be provided if the building is going to be occupied during the renovation/repair work being performed.

c) Any painted surfaces that have loose, flaking, chipping or otherwise non-intact paint should not be impacted by the Contractor and should be reported to the Project Manager.

d) The Contractor is responsible for developing, implementing and maintaining their Lead Exposure Control Program in accordance with OSHA standards as it applies to the work of the contract. The Contractor shall ensure that its Lead Exposure Control Program meets all of the requirements of OSHA, RIDOH and RIDEM.

e) Lead paint abatement contractors should coordinate with the Project Manager and EHS for specific requirements for lead abatement work and disposal of materials. Refer to the Hazardous Waste Management section of this program for specific requirements on the proper disposal of lead containing paint.

f) Characterization of Lead Contaminated Material. There are separate analyses required for evaluation of lead contamination with respect to worker safety and waste disposal. Analysis of total lead concentration is used to evaluate the hazards for compliance with the RIDOH and OSHA worker safety requirements. Total lead concentrations, in most cases, cannot be used to determine the proper method of disposal. Total lead concentrations can only be used if the concentration found is less than 100 parts per million. TCLP testing is the only definitive test method for determining allowable disposal methods for lead-contaminated materials. Contractors shall work with one of the Industrial Hygiene consultants to develop and implement a sampling and analytical plan to appropriately characterize the impacted areas and waste to be disposed.

- Sampling and Analysis for Total Lead Concentrations for Safety. Appropriate sampling protocols for potentially lead contaminated materials will depend on the surfaces or materials impacted. Contractors shall work with one of the Industrial Hygiene consultants to develop and implement a sampling and analytical plan to appropriately characterize the materials to be impacted.

- Sampling and Analysis for Waste Disposal. There are two approaches for characterizing lead-contaminated materials for disposal. Pre-characterization sampling of impacted materials can take place at the beginning of the project if all or most of the lead-contaminated materials are accessible. This will allow segregation of waste that is considered hazardous from other non-hazardous wastes. Alternatively, lead contaminated debris can be sampled at the end after all the lead contaminated material has been collected. In either case, representative samples of all lead contaminated materials must be taken to determine the proper disposal of the material. An adequate

number of representative composite samples of the waste shall be collected and analyzed by TCLP to determine the proper disposal route. Representative sample must include all material to be disposed (e.g., not just paint flakes). As noted above, Contractors shall work with one of the Industrial Hygiene consultants to develop and implement a sampling and analytical plan to appropriately characterize the waste to be disposed. TCLP analytical results that show the material concentration of less than 5.0 mg/L (5 ppm) of lead can be disposed of as non-hazardous waste. TCLP analytical results that show the material concentration of greater than or equal to 5.0 mg/L (5 ppm) of lead must be disposed of as hazardous waste. All analytical results must be submitted to EHS for review before disposal can take place. In addition to the TCLP results, MSDS's for any stripper or material used to remove paint must be submitted to EHS for proper waste determination. All hazardous waste must be stored, labeled and contained in compliance with all Federal and State Regulations as outlined in the Hazardous Waste Management Section in this program. Additional waste collection requirements may be required by the waste hauler selected.

g) Brown University uses a select group of approved industrial hygiene consultants that perform services for the University. For a complete listing of approved industrial hygiene consultants for Brown University see Appendix A of this program. Any other company must receive specific approval by EHS, Purchasing & Facilities Management

5) Hazardous Waste Management

a) All hazardous waste generated must be collected and stored in compliance with federal and state requirements.

b) Hazardous wastes include, but are not limited to, waste oil, contaminated fuels, lead contaminated paint or debris, spent products, spill clean-up materials, used solvents, unusable products, batteries, fluorescent tubes, lighting ballasts and mercury containing switches.

c) Excess products or leftover unused/surplus chemical products must be appropriately removed by the contractor prior to completion of the job. Excess product, including "touch up" paint, is considered abandoned waste by the EPA if it is left behind by a contractor on campus. Products must not be abandoned or otherwise left on campus unless specifically requested by the Brown University Project Manager. Abandoned products include but are not limited to paints, chemicals, solvents, compressed gases, adhesives, caulking, oils, mastics, refrigerants, building materials, fuels, etc.

d) At no time shall hazardous waste be disposed of in chutes, dumpsters, drains, pipes or any similar waste container. The Contractor shall work with the Project Manager and any consultants engaged by the Project Manager to perform services with respect to the analysis, detection, removal, containment, treatment and disposal of such regulated materials.

e) The Contractor must ensure, at a minimum, proper labeling, adequate secondary containment, segregation of incompatible materials and routine inspection of storage areas as required by law.

f) All hazardous waste containers shall be constructed of a material that is compatible with the waste, shall be in sound condition, and shall be kept securely closed at all times in accordance with RIDEM Hazardous Waste regulations. Containers and/or tanks used to store hazardous wastes must be managed in accordance with EPA and RIDEM regulations.

g) The contractor must ensure that hazardous waste is packaged as follows:
- All containers will meet all applicable DOT requirements. Any existing labels on the containers must be removed or completely painted over prior to using it for waste.
- Waste Storage – Drums may be used to store either liquid or solid materials, but if a liquid is stored in a drum it must be stored on a secondary containment pallet. Boxes may only be used for solid material and shall have a 6-mil poly liner and be secured to a pallet. Roll-offs may only be used for solid material and shall have a 6-mil poly liner. Roll-offs shall be covered so as to protect waste from contact with rainwater. All waste storage containers must be closed and secured except when adding materials to the container.
- All containers must be labeled as soon as material is added to it. Hazardous waste labels can be obtained from the selected waste hauler. For drums, labels will be attached to the side of the drum near the top. The drums are to be stored so that the labels are easily visible at all times. For boxes, two sets of labels must be attached and be on opposite sides of the box. All labels will be attached to box near the top, and the containers are to be stored so that the labels are easily visible at all times. Duct tape or similar shall be used to close the box flaps. Two sets of labels must be attached and be on opposite sides of the roll off. All labels must have the words "Hazardous Waste" and must identify the contents of the container. All materials placed in the roll-off shall be no more than three feet long in any direction and the roll-off may not be filled higher than the sidewalls.
- The contractor must ensure:
  (a) The containers are in good condition (e.g., no damage, dents, excessive rust).
  (b) There is no water damage to the container and that the waste is protected from the weather.
  (c) If a container is damaged, the waste must be transferred to a new container with the appropriate labels.

i) Waste containers must not be moved from the work site without permission of EHS. When multiple projects are being completed on campus, waste is not to be moved from project area to project area without consultation and approval of EHS.

h) The contractor must arrange for the performance of all waste characterizations of the waste generated at the site as required by the waste disposal location. Contractors must provide all results of waste characterization to EHS. Contractors will coordinate with EHS and the waste disposal location to develop the waste profile. The EHS must review and sign waste profiles prior to the contractors arranging for waste shipment.

i) Waste must be transported from the work site within 90 days of the date of generation or when the project is completed, whichever is sooner. Waste must not be moved off-site without the approval of EHS. The contractor must coordinate the waste shipment with the waste hauler and with staff from EHS.

j) The Contractor, in coordination with EHS staff and the hazardous waste transporter, is responsible for completing all disposal documents, which may include, but are not limited to, waste profiles, waste analytical samples and hazardous waste manifests.

k) Brown University has several EPA Identification Numbers (EPA ID) defined by specific contiguous areas of the campus and must be used on all hazardous waste shipment manifests. Waste shipment contractors must contact EHS to receive the appropriate EPA ID's for their shipment. EHS will provide the contractor with the appropriate EPA ID number or request a new temporary EPA ID number from RIDEM if an EPA ID number does not exist for the

work location. Contractors or subcontractors shall not obtain EPA ID numbers on behalf of Brown University under any circumstances.

l) Brown University (Office of Environmental Health & Safety, Box 1914, 164 Angell Street, Providence, RI 02912) shall be designated as the Generator on all documents and shall be provided with copies of all waste analyses, land disposal restriction forms and related documentation.

m) The Brown University Environmental Compliance Officer 401-863-3850 or the Environmental Compliance Specialist 401-863-1610 are the only staff allowed to sign the hazardous waste manifest(s) for Brown University. At the time of shipment, the Contractor shall provide the appropriate copies of the manifest to the EHS representative for distribution to the appropriate agencies.

n) In the event a Contractor encounters previously unidentified material that is reasonably believed to be radioactive, volatile, corrosive, flammable, explosive, biomedical, infectious, toxic, hazardous, asbestos containing or oil-based, the Contractor shall immediately stop work in the affected area and report the condition to the Project Manager.

o) Waste Hauling
- Waste hauling or disposal subcontractors shall be selected from an approved list provided by EHS. The Contractor must establish a contract with the proposed waste hauler for the management of the waste prior to the commencement of the work. Any questions regarding waste hauling should be directed to the EHS office by calling 401-863-3850 or 401-863-3353.
- For a complete listing of approved companies that perform waste hauling services for Brown University, see Appendix A of this program. Any other company must receive specific approval by EHS, Purchasing and Facilities Management.

6) Transportation of Hazardous Materials

a) All transportation of hazardous materials while on Brown University property shall be conducted in accordance with USDOT Hazardous Materials Regulations for proper packaging, marking/labeling, handling, documentation, etc. At no time should hazardous materials be transported via public or private roads at Brown University in a manner that could result in an unsafe condition for personnel or the environment.

7) Universal Wastes (Fluorescent Bulbs, Batteries, Mercury Containing Devices)

a) In the State of RI, certain batteries, fluorescent bulbs and mercury containing devices (e.g., mercury switches, mercury thermostats) are considered hazardous waste if they are disposed. RIDEM considers these wastes “Universal Wastes” if they are to be recycled in lieu of being disposed of as hazardous waste. Brown University requires that all Universal Wastes be recycled.

b) Universal Wastes cannot be disposed of with regular trash.

c) Universal Wastes, especially fluorescent bulbs, shall be handled so that they remain unbroken. Boxes must be closed at all times except when bulbs are being added to the container. Bulbs cannot stick out of the boxes. Universal Wastes that become broken must be collected, stored and disposed of as hazardous waste.

d) Store Universal Wastes in closed containers obtained from the proposed transporter or in those approved for use by the transporter.

e) Containers must be labeled with a Universal Waste label with the contents identified and the date when waste was first added to the container.

f) Containers must be stored indoors.

8) Electrical Ballasts

a) Older (pre 1980) light ballasts can contain Polychlorinated Biphenyls (PCBs). As a result, these lighting ballasts are considered hazardous waste in the state of RI. Ballasts manufactured after 1980 do not contain PCBs, however, it is the policy of Brown University to collect these ballasts and send them off-site for recycling.

b) Ballasts cannot be disposed of with the general trash. Ballasts that do not contain PCBs will state "No PCBs" on the ballast product label. If there is no information on the label regarding PCBs it must be considered a PCB ballast. It is more expensive to dispose of PCB ballasts. As a result, PCB and non-PCB ballasts must be segregated as they are removed from the fixtures. Separate containers should be established for each type of ballast and labeled appropriately.

9) Oil Containing Equipment

a) The installation or removal of any oil-containing equipment that contains 55 gallons or more of any type of oil triggers the requirement to update the University's Oil Spill Prevention Control and Countermeasures (SPCC) plan. Contact EHS to notify of any changes to oil containing equipment.

b) Waste oil and oil-contaminated debris are considered a hazardous waste in Rhode Island. Contractors at Brown University must comply with all state and federal requirements including RIDEM hazardous waste regulations for waste oil and oil-contaminated debris.

c) Underground Storage Tank (UST) removal must be pre-approved by the RIDEM. Contractors must work with EHS to submit an Application for Permanent Closure of a UST Form to RIDEM. A copy of the form can be found at the following URL: http://www.dem.ri.gov/programs/benviron/waste/pdf/ustclosr.pdf. Approval can take 1-2 weeks. Please note this applies to both identified USTs and unknown USTs discovered during excavation. Contact EHS as soon as a previously unknown UST is discovered.
- Contractors must coordinate the application for closure with EHS.
- Contractors shall work with EHS and Facilities Management to identify the contents. If the contents are uncontaminated, the contractor shall use a licensed transporter to move the contents to an on-site tank with the same type of material. Ensure that the destination tank has adequate capacity to hold the material. If oil is contaminated (not reusable), work with EHS to properly dispose of the oil as a hazardous waste.
- All releases/spills must be reported immediately to EHS.
- Tanks must be cut/cleaned per Providence Fire Marshal's regulations.
- Closure Assessment reports are required if fuel has leaked.
- Tank closures-in-place are only approved under special conditions.
- The closure report, if required, must be submitted to the State within 30 days and shall be submitted to EHS at least 7 days prior to the due date.

- For a complete listing of approved companies that perform UST removal and waste fuel hauling services for Brown University see Appendix A of this program. Any other company must receive specific approval by EHS, Purchasing & Facilities Management.

d) Aboveground Storage Tank (AST) removal must be coordinated with EHS.
   - The contractor shall work with EHS and Facilities Management to identify the contents of the AST. If the contents are uncontaminated, the contractor shall use a licensed transporter to move the contents to an on-site tank with same type of material. Ensure that the destination tank has adequate capacity to hold the material. If oil is contaminated (not reusable), work with EHS to properly dispose of the oil as a hazardous waste.

e) Oil Spill Prevention and Control. Brown University's Spill Prevention Control and Countermeasures (SPCC) Program establishes University-wide procedures for the prevention and detection of spills and/or releases of oil or hazardous materials.
   - Based on the inventory of oil that will be brought on-site, the Contractor shall have available equipment (e.g., secondary containment pallets, absorbent pads, absorbent booms, speedy-dry) that is suitable and sufficient to control a potential spill/release of petroleum products used during the project.
   - The Contractor is responsible for identifying conveyances to the environment (e.g., sumps, storm/floor drains, etc.) and adequately minimizing spill potential to these areas.
   - The Contractor is responsible for the proper storage of all petroleum products so as to prevent spills.
   - The Contractor must use appropriate protective procedures such as secondary containment, overflow protection, employee training, and other measures as part of activities involving the use, storage, or handling of petroleum products or hazardous materials on Brown University Property.

10) Soil Management

a) Urban soils are often contaminated with lead, arsenic and polynuclear aromatic hydrocarbons (PAH). The presence of these contaminants can be naturally occurring or can result from the deposition of hazardous materials (e.g., from coal ash, leaded gasoline, lead paint) over the last century. The soils on the Brown University campus may have these contaminants at concentrations above the regulatory levels set by the RIDEM. If contaminants are present above specific concentrations, the soil may be subject to RIDEM Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases.

b) Movement of contaminated soils off-site is a time consuming and costly effort. Priority should be given to reusing the soils on-site, if possible. Impacted soils kept on site during construction must remain covered at all times to prevent run-off from precipitation. Contractors are also responsible for following all of the requirements in the Excavation section of this program. Contractor shall not sample or remove any soils off-site without prior approval from EHS.

c) The planning and approval process surrounding contaminated soils is long and complicated. The Project Manger is strongly encouraged to work with the EHS early in the planning portion of a project involving contaminated soil or potentially contaminated soils to ensure the regulatory process does not affect the project timeline.

11) Stormwater

a) Projects that disrupt more than one (1) acre of land must adhere to the RIDEM's Phase II stormwater requirements. These projects are required to obtain a RIPDES permit from the RIDEM. This entails submitting a Notice of Intent (NOI) to be covered under the General Stormwater Permit Associated with Construction Activities. Contractors are responsible for coordinating the completion of the NOI for stormwater discharge permit in coordination with EHS. Contractors are responsible for developing and implementing best management practices for the site and adherence to all conditions of the permit obtained. Contractors shall develop and implement a Stormwater Pollution Prevention Plan as required by the permit. Stormwater Pollution Prevention Plans must be submitted for approval to EHS.

b) For projects that disrupt less than one (1) acre of land, Brown University requires contractors to provide erosion control plans for constructions sites where runoff may disrupt municipal stormwater systems. The contractor will be held responsible for cleaning of catch basins or stormwater systems which were clogged as a result of erosion on a site. Contractors shall develop and implement best management practices for controlling stormwater runoff from the site.

12) Wastewater

a) Brown University's wastewater discharge is regulated by NBC, and in some cases, the RIDEM. The discharge of any wastewater must adhere to all wastewater discharge prohibitions. These include, but are not limited to:
- No discharge of mercury, silver or other metal-bearing wastewater.
- No discharge of highly corrosive substances (pH < 5 or pH > 11).
- No discharge of flammable materials that could create a hazard for Brown University personnel or NBC treatment works personnel.

b) If there is an existing discharge permit at the location and it is anticipated that an increase in wastewater discharge by more than 20% from the site, a new wastewater hook-up permit from the NBC will be required. A new or revised NBC Pretreatment permit may also be required depending on the type of discharge anticipated.

c) If the project includes excavation that will require water discharge from the site (e.g., dewatering operations), then the potential location of the discharge must be determined. The Contractor must then determine whether the discharge line drains to a body of surface water (stormwater line) or to the NBC sewage system. If there both are available, the discharge will likely be required to discharge to the storm water line.
- If discharging to stormwater sewers, work with EHS and contractors to design a pretreatment system and obtain a RIPDES water discharge permit from RIDEM.
- If discharging to the NBC sewer system, work with EHS and contractors to design a pretreatment system and apply for a wastewater discharge permit from NBC. Lead time on getting discharge permits can be 60 days.

d) If there will there be wastewater discharge from the site after the completion of the project, determine the potential location of the discharge, determine whether the sewer line drains to a body of surface water (stormwater line) or to the NBC sewage system.
- If only Sanitary Wastewater discharge will occur, only an NBC hook-up permit is required.
- If other wastewaters will be generated, apply for an NBC pretreatment permit.

- Discharge of wastewaters through stormwater lines after construction is complete is unlikely to be allowed. If this option is planned, Brown will need to obtain a RIPDES discharge permit from RIDEM.

13) Pest Control

a) If a Contractor witness's evidence of cockroaches, mice, ants or other pests during the course of their work, they must notify the Project Manager of the condition. The Contractor shall not use any insecticide or pesticide products on University property unless such activities are part of the contracted work and the contractor is specifically trained and licensed to do so.

14) Mold Prevention & Remediation

a) Brown University recommends following EPA's mold remediation guidelines in the publication entitled "Mold Remediation in Schools and Commercial Buildings ", which can be found at the following URL: http://www.epa.gov/iaq/molds/index.html

b) Contractor Requirements for Mold Prevention
- Safely investigate and evaluate mold and moisture problems to prevent exposures and minimize spreading mold spores.
- React quickly to reports of moldy conditions when found. Time is of the essence to prevent spreading of mold.
- The Contractor shall not sweep, dust, vacuum, or mop dust or debris that is contaminated with mold.
- The Contractor shall also not pick up or throw away any suspect mold-contaminated waste or trash.
- If the material is mold-contaminated and is disturbed and becomes airborne, the Contractor shall immediately notify the Project Manager and EHS.

c) Handling Moldy Conditions
- If the mold is a known preexisting condition, Brown University may have determined, before work is begun, the presence, location and quantity of mold-contaminated materials that would be specifically impacted by the work of the contract.
  (a) The Project Manager will provide any available mold inspection reports for those work areas in question.
- If the presence of mold is newly discovered, Contractors must immediately convey to the Project Manager any information they discover concerning the presence, location and quantity of mold-contaminated materials.
- For mold areas less than 100 sq. ft., Contractors must follow EPA guidelines to clean-up.
- For mold areas greater than 100 sq. ft., only approved mold remediation contractors listed in Appendix A of this program will be allowed to clean-up. Any other company must receive specific approval by EHS, Purchasing & Facilities Management.
- The Contractor shall not disturb moldy materials unless such activities are part of the contracted work and the contractor is listed as an approved mold remediation contractor in Appendix A of this program.
- Approved mold remediation contractors should coordinate with the Project Manager and EHS, as necessary, for specific requirements for mold remediation work.

d) All sampling (air, wipe or other) for mold remediation projects must only be performed with approval from EHS.

- Brown University uses a select group of approved industrial hygiene consultants that perform services for the University. For a complete listing of approved industrial hygiene consultants for Brown University see Appendix A of this program. Any other company must receive specific approval by EHS, Purchasing & Facilities Management.

VI. Responsibilities

1) Contractors

   a) All Contractors who perform any service to Brown University are required to follow all federal, state and local regulations and laws as well as the policies of Brown University contained within this program. This Construction Safety & Environmental Management Program has been developed for the protection and safety of Brown University students, faculty, staff, neighbors and property. This program shall be provided to Contractors to aid in the communication of hazard information for University properties and to outline Brown's safety and environmental procedures.

2) Facilities Management

   a) Facilities Management must implement this program by providing a copy to all contractors working at Brown University. This program may be included with the project's contract documents.

   b) Facilities Management supervisors shall ensure University employee compliance with all of the policies set forth by this program by:
      - Being familiar with this program,
      - Making necessary safety training mandatory for employees, and
      - Correcting identified problems.

   c) Facilities Management must review this program upon request and provide feedback to EHS.

3) Project Managers

   a) Project Managers shall help ensure Contractor compliance with all of the policies set forth by this program by including this program into project specifications and communicating problems to the Contractor when they are identified.

   b) Brown University suggests that contractors implement the contents of this program through weekly safety talks with sub-contractors and their employees.

   c) Project Managers must approve work as described in this program.

   d) Project Managers must notify building occupants and other stakeholders of the project of all construction progress, including but not limited to egress changes, utility shut down/start up, etc.

4) Environmental Health & Safety

   a) EHS must evaluate all work activities described in the Safety Permits and Approval Procedures section of this program upon request. Approval or denial of approval will be determined based on the evaluation.

b) EHS will review this program and update as necessary.

c) EHS should develop written guidance documents and training materials to support this program. EHS should provide training to University staff covered by this program upon request.

d) EHS may recommend personal protective equipment and safe handling procedures for specific operational needs upon request.

e) EHS may respond to reports of hazardous conditions/accidents during construction projects and assist in determining corrective measures.

f) EHS may assist the Project Manager in performing safety evaluations of construction activities upon request.

VII. Training Requirements

All Contractors working at Brown University must train all of their employees in accordance with all federal, state and local regulations pertaining to the work they are performing.

All Brown University Project Managers must read and be familiar with the requirements of this program. If available, Project Managers should attend a training session provided by EHS on the contents of this document.

VIII. References

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U.S. Department of Labor, OSHA Standard 29 CFR 1926, Safety and Health Regulations for Construction, Subpart M Fall Protection. Occupational Safety and Health Administration.

U.S. Department of Labor, Construction Safety & Health Outreach Program – Fall Protection. Occupational Safety and Health Administration. 1996.

U.S. Department of Labor, Safety and Heath Topics: Construction: Laser Hazards, Occupational Safety and Health Administration. www.osha.gov/SLTC/constructionlaserhazards. December 17, 2003

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APPENDIX A

EHS Approved Contractor Listing

EHS Approved Contractor Listing

The Office of Environmental Health & Safety (EHS) maintains this listing of approved contractors to assist Facilities Management Project Managers and Contractors working for the University in the selection of contractors and consultants working with hazardous materials. This approval is only an approval from EHS and does not imply that these contractors are exempt from additional approval with other departments at the University (i.e., Facilities Management, Purchasing, etc.). Contractors on this list may not sub-contract their work to another contractor or company.

Approved Hazardous Waste Hauling Contractors

Triumvirate Environmental, Inc.
61 Inner Belt Road, Somerville, MA 02143
Phone: (800) 966-9282
Contact: Kathryn Johnson *(All Wastes)*

Clean Harbors Environmental Services, Inc.
1 Hill Avenue, Braintree, MA 02185
Phone: (800) 282-0058 x3373
Contact: David R Batogowski *(All Wastes)*

Marshall Environmental Group, Inc.
10 Dawn Lane, Warwick, RI 02886
Phone: (401) 736-9001
Contact: Wes Hodge *(Soil & Oil Waste Only)*

Pro-Teck LLC
85 Willow St, New Haven, CT 06511
Phone: (203) 624-9461
Contact: Jennifer Mancini *(Lead Waste Only)*

Veolia Environmental Services
218 Canton Street, Stoughton, MA 02072
Phone: (800) 478-6055
Contact: Amanda Poverchuk *(Fluorescent Bulbs and Lighting Ballasts Only)*

Approved Underground Storage Tank Removal and Fuel Hauling Contractors

Clean Harbors Environmental Services, Inc.
1 Hill Avenue, Braintree, MA 02185
Phone: (800) 282-0058 x3373
Contact: David R Batogowski

Cyn Environmental Services
1771 Washington Street, Stoughton, MA 02072
Phone: (781) 341-1777
Contact: Peter Avery

ATC Associates Inc. (Lincoln)
333 Washington Highway, Smithfield, RI 02917
Phone: (401) 232-3353
Contact: David Gavin

Triumvirate Environmental
61 Inner Belt Road, Somerville, MA 02143
Phone: (800) 966-9282
Contact: Kathryn Johnson

Approved Industrial Hygiene Consultants

Rhode Island Analytical (RIAL)
41 Illinois Avenue, Warwick, RI 02888
Phone: (401) 737-8500
Contact: Daniel Simas, Jim Gallagher

Emery Environmental Associates
P.O. Box E, Pawtucket, RI 02861
Phone: (401) 727-4941
Contact: Patrick Emery

Approved Asbestos Abatement Contractors

ACME Abatement Contractor Inc.
52 Fuller Street, Seekonk, MA 02771
Phone: (508) 336-5551
Contact: Veasna Neth

LVI Environmental Services Inc.
401-S Second Street, Everett, MA 02149
Phone: (617) 389-8880
Contact: Peter Scopa or David P. Pearson

Moran Environmental Recovery LLC
100 Water Street, East Providence, RI 02914
Phone: (401) 431-9514
Contact: James Silvia

Pasquazzi Brothers Inc.
464 Dyer Avenue, Cranston, RI 02920
Phone: (401) 942-2250
Contact: Henry Pasquazzi

Sitecon Corporation
1430 Cranston St., Suite A, Cranston, RI 02920
Phone: (401) 944-2335
Contact: Michael Lema

TMC Services, Inc.
One William Way, Bellingham, MA 02019
Phone: (508) 966-3737
Contact: Matthew Iovanni

Yankee Fiber Inc.
2 Dexter Road, East Providence, RI 02914
Phone: (401) 435-4390
Contact: Ron Gagnon or Jim Hutzler

Approved Mold Remediation / Building Drying Contractors

Enviro-Clean, Inc.
41 Cedar Swamp Road, Smithfield, RI 02917
Phone: (401) 231-3130
Contact: Eric Anderson

Providence Fire Restoration, Inc.
291 Kenyon Avenue, Pawtucket, RI 02861
Phone: (401) 725-3380
Contact: Christopher Howe, Jr.

Front Line Inc.
58 Mellen Street, Hopedale, MA 01747
Phone: (508) 634-6600
Contact: Jeff Allen

1-800-Water Damage
2158 Plainfield Pike, Cranston, RI 02921
Phone: (401) 437-8369
Contact: Mike Deffley

Approved Lead Abatement Contractors

The Office of Environmental Health & Safety does not specifically approve contractors that work on either interior or exterior lead abatement projects. The only requirement is that the contractor be licensed by the appropriate State agency. For ease of reference EHS has enclosed copies of the web links that list the current licensed contractors.

- For interior work the contractor must be licensed through the RI Department of Health: http://www.health.ri.gov/lead/lists/leadlicense.php.
- For exterior work the contractor must be licensed through the RI Department Environmental Management: http://www.dem.ri.gov/programs/benviron/assist/extlead/pdfs/conlist.pdf.

APPENDIX B

Project Environmental Checklist

Project Environmental Checklist

This document provides a reference checklist for Project Managers to identify specific environmental requirements and provide guidance on how to proceed to manage the requirement. This Checklist does not encompass all health, safety and environmental requirements during construction projects. Please be sure to refer to the appropriate section or appendices of the Construction Safety and Environmental Management Program (CSEMP) for more details or contact the Office of Environmental, Health and Safety at (401) 863-3353. Please forward completed checklist to Henry Huppert at Henry_Huppert@brown.edu.

Project Name: _____ **Project Manager:**_____

Planning/Project Number: _____ **Project Start Date:** _____ **Project End Date:** _____

Project Scope Narrative:

1. Air Emissions (Fuel Burning Equipment)			
General	**Yes**	**No**	**Required Activities**
Will the project include **removing or modifying** any existing fuel burning equipment (e.g., boilers, generators, hot water heaters)?	☐	☐	**If yes**, removal/modification of fuel burning equipment may trigger reporting and updating of the University's Air Operating Permit. Provide EHS with identification of the unit(s) to be removed or modified and specific information on the changes proposed. **If no**, no further action is necessary.
Emergency Generators	**Yes**	**No**	**Required Activities**
Will the project include installing an emergency generator with an input heat duty of **less than** 350,000 BTU/Hr, or in the case of internal combustion engines, is **less than** 50 HP?	☐	☐	**If yes**, provide EHS with location and input duty of the generator so it can be added to list of insignificant sources in the University's Air Operating Permit. **If no**, no further action is necessary.
Will the project include installing an emergency generator with an input heat duty of 350,000 BTU/Hr or more, or in the case of internal combustion engines, is 50 HP or larger?	☐	☐	**If yes**, Brown is required to submit an Application for a General Permit for an Emergency Generator and the unit must be added to the University's Air Operating Permit. Please work with contractor supplying equipment and EHS to complete the application. Please note that the unit cannot be installed until permit approval is received from the RI Department of Environmental Management (RIDEM). Once permit application is submitted, permit is typically received in approximately six weeks. **If no**, no further action is necessary.

Boilers and Other Fuel Burning Equipment	Yes	No	Required Activities
Will the project include installing any fuel burning equipment with an input heat duty of **less than** one million BTU/Hr?	☐	☐	**If yes**, provide EHS with location and input duty so it can be added to the list of insignificant sources. **If no**, no further action is necessary.
Will the project include installing any fuel burning equipment with an input heat duty of greater than or equal to one million BTU/Hr?	☐	☐	**If yes**, the unit must be added to the University's Air Operating Permit. Please provide EHS with location and detailed specifications for the proposed unit. **If no**, no further action is necessary.
Will the project include installing any fuel burning equipment with an input heat duty of more than 10 million BTU/Hr for gas-fired equipment or 5 million BTU/hr for oil fired equipment?	☐	☐	**If yes**, Brown is required to submit an Application for Approval of Plans to Construct, Install, or Modify Fuel Burning Equipment and the unit must be added to the University's Air Operating Permit. Please work with contractor supplying equipment and EHS to complete the application. Please note that the unit cannot be purchased until permit approval is received from the RIDEM. Permit approval may take at least 90 days. **If no**, no further action is necessary.
Air Emissions (Air Toxics) The list of Air Toxics and Minimum Quantities can be found by on the RIDEM website by clicking this link and going to page 29.			
	Yes	**No**	**Required Activities**
Will the project include installing any equipment that has the potential to emit any of the 223 Air Toxics by an amount greater than the Minimum Quantity for that contaminant specified in Regulation 22? (See above link for minimum quantities.)	☐	☐	**If yes**, please consult with EHS immediately as "No person shall construct, install, or modify or cause construction, installation, or modification of any stationary source which has the potential to increase emissions of a listed toxic air contaminant by an amount greater than the Minimum Quantity for that contaminant specified in Regulation 22 without first obtaining an approved permit to construct, install or modify from RIDEM". **If no**, no further action is necessary.
2. Asbestos Containing Materials			
	Yes	**No**	**Required Activities**
Has an asbestos survey been performed for the building materials that will be impacted by the scope of your project work in buildings constructed prior to 1987?	☐	☐	**If yes**, Please abate all asbestos containing building materials (ACBM) impacted by the scope of your project. Notify EHS of ACBM that is not going to be abated as part of your project. **If no**, hire an approved industrial hygiene consultant to perform an inspection with sampling to determine if ACBM is present and may be disturbed during the project.
Will the project include impacting any asbestos containing building material?	☐	☐	**If yes**, All asbestos work must be performed by licensed asbestos abatement contractors listed on the EHS Approved Contractor Listing. All other Contractors shall not disturb, damage or otherwise handle any suspect ACBM. Provide inspection report, air sampling results and original waste shipment records to EHS for recordkeeping. **If no**, forward all sampling results to EHS.
Will the project impact more than 25 square feet or 10 linear feet of asbestos containing building material?	☐	☐	**If yes**, an Asbestos Abatement Plan must be developed by a Brown approved industrial hygiene consultant and submitted to the RI Department of Health. Project must include air monitoring etc. Provide inspection report, air sampling results and original waste shipment records to EHS for recordkeeping. **If no**, no further action is necessary.
3. Lead Containing Materials			
	Yes	**No**	**Required Activities**
Does the scope of work involve plumbing which may impact lead service or distribution piping within the building?	☐	☐	**If yes**, plan to replace the lead service and/or distribution piping to the extent feasible. Contact EHS to discuss any work that may impact such systems. **If no**, no further action is necessary.

Does the scope of work involve impacting or removal of surfaces with lead containing paint from the interior or exterior of any structure? Any property built before 1978 is considered to have the potential for lead containing painted surfaces.	☐	☐	**If yes for exterior work:** • Follow RIDEM Air Regulation 24, Brown hazardous waste disposal requirements and notify all neighbors. Brown Public Affairs & University Relations 863-3717 will notify external (non-Brown) neighbors and Facilities Management Service Response 863-7800 will notify Brown faculty, staff & students who are neighbors to a project. **If yes for interior work:** • The project must ensure that all paint is intact. i.e., no chipping, flaking or peeling paint can remain. • The project must abate all friction surfaces on all doors and windows if occupied by children less than 72 months of age. **If no**, no further action is necessary.
Will the project generate lead painted debris? (i.e., windows, window sashes, doors, jams, moldings or trim).	☐	☐	**If yes**, contact EHS (401-863-3353) for the best method for disposal. The options for this type of waste include: • Dispose of all material as hazardous waste. • Perform sampling to determine if waste can be disposed of in regular landfill. **If no**, no further action is necessary.
4. Hazardous Waste Management			
	Yes	**No**	**Required Activities**
Will the project be generating any hazardous waste (e.g., lead paint, waste oils, adhesives, unusable products)?	☐	☐	**If yes**, ensure that all waste is collected and stored in compliance with federal and state requirements (e.g., in appropriate containers that are closed, labeled, secured and protected from weather). Transport and disposal of waste must be completed by Brown approved waste management vendors. Contractors can work directly with approved vendors to obtain containers, supplies etc. **EHS must approve and sign all waste manifests.** **If no**, please contact EHS to discuss the definition of hazardous waste. Nearly all projects will generate some hazardous waste.
Has the contractor left any materials onsite at the conclusion of the Project? i.e., paints, adhesives, lubricants, oils.	☐	☐	**If yes**, have contractors removed all usable materials from the site at the conclusion of the work. No excess paint, adhesives or other supplies should be left on-site. Unusable materials should be handled as hazardous waste as described above. **If no,** Good Job!
5. Universal Waste (Fluorescent Bulbs, Batteries, Mercury Containing Devices)			
Batteries	**Yes**	**No**	**Required Activities**
Will the project generate any waste batteries (e.g., lead acid, alkaline, Ni-Cad etc.)?	☐	☐	**If yes**, batteries shall be handled so that they remain unbroken. Store batteries in closed containers obtained from the proposed transporter or in those approved for use by the transporter. Containers must be labeled with a Universal Waste label with the contents identified and the date when batteries were first added to the container. Batteries must be stored indoors. Batteries cannot be disposed of with regular trash. All batteries must be sent for recycling. **If no**, no further action is necessary.
Fluorescent Bulbs	**Yes**	**No**	**Required Activities**
Will the project generate waste fluorescent bulbs?	☐	☐	**If yes**, fluorescent bulbs shall be handled so that they remain unbroken. Store bulbs in cardboard boxes obtained from the proposed transporter or in those approved for use by the transporter. Containers must be labeled with a Universal Waste label with the contents identified and the date when bulbs were first added to the container. Boxes of tubes must be stored indoors. Bulbs cannot be disposed of with regular trash. Compact fluorescent bulbs must be handled in the same manner as long bulbs. All unbroken fluorescent bulbs must be sent for recycling. **If no**, no further action is necessary.

Mercury Containing Devices	Yes	No	Required Activities
Will the project generate any waste mercury-containing devices (e.g., mercury switches, thermostats etc.)?	☐	☐	**If yes**, devices shall be handled so that they remain unbroken. Store devices in closed containers obtained from the proposed transporter or in those approved for use by the transporter. Containers must be labeled with a Universal Waste label with the contents identified and the date when devices were first added to the container. Devices must be stored indoors. Mercury containing devices cannot be disposed of with regular trash. All devices must be sent for recycling. If mercury containing devices break or leak, contact EHS immediately. All intact mercury containing devices must be sent for recycling. Broken devices must be managed as hazardous waste **If no**, no further action is necessary.
6. Electrical Ballasts			
	Yes	**No**	**Required Activities**
Will the project generate waste electrical light ballasts?	☐	☐	**If yes**, collect and separate PCB ballasts from non-PCB ballasts. Separate containers should be established for each type of ballast and labeled appropriately. Ballasts cannot be disposed of with the general trash. Work with approved EHS waste vendors to arrange for removal of waste ballasts. **If no**, no further action is necessary.
7. Oil Containing Equipment			
	Yes	**No**	**Required Activities**
Will the project include removing any Underground Storage Tanks (UST)?	☐	☐	**If yes**, we must submit an Application for Permanent Closure of a UST Form to RIDEM. Approval can take 1-2 weeks. Coordinate with EHS and tank closure contractors. *Please note this applies to both identified USTs and unknown USTs discovered during excavation. Contact EHS as soon as a previously unknown UST is discovered.* **If no**, no further action is necessary.
Will the project include installing any Underground Storage Tanks?	☐	☐	**If yes**, an application for UST installation including engineering drawings must be submitted to RIDEM at least 6-8 weeks prior to installation. Approvals from EHS and RIDEM are required prior to installation. **If no**, no further action is necessary.
Will the project include removing or installing any Aboveground Storage Tanks (AST)?	☐	☐	**If yes**, AST must have: • Secondary containment greater than or equal to 110% of the tank capacity; • A minimum of a 3 gallon spill bucket at the fill pipe; • The tank capacity and type of fuel identified on the tank near the fill pipe; • All fuel lines will be protected by secondary containment; Tanks must be added/removed from the SPCC plan. **If no**, no further action is necessary.
Will the project be adding or removing any equipment that contains 55 gallons or more of oil (e.g., elevators, transformers, switches)?	☐	☐	**If yes**, all oil containing equipment with a capacity of 55 gallons or more are subject to the Federal Oil Spill Prevention (Type of oil does not matter). Additions and subtractions must be made to the SPCC plan and must be coordinated with Facilities Management Operations and EHS. Oil from equipment being removed must be tested for Polychlorinated Biphenyls before disposal. **If no**, no further action is necessary.
8. Soils			
	Yes	**No**	**Required Activities**
Will the project include the removal of any soil from Brown property?	☐	☐	**If yes**, Contractors shall not sample or remove any soils off-site without prior approval from EHS. Urban soils often contain lead, arsenic, and polynuclear aromatic hydrocarbons that exceed state limits. If contaminants are present above specific concentrations, the soil may be subject to RIDEM Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases. Priority should be given to reusing the soils on-site. Impacted soils kept on site during construction must remain covered at all times to prevent run-off from precipitation. Engage EHS and contractors early in the process to discuss soils issues. **If no**, no further action is necessary.

9. Stormwater			
	Yes	**No**	**Required Activities**
Will the project disturb more than one acre of land? Measurements typically include all areas inside the construction site limit for the project.	☐	☐	**If yes,** the project is required to get a Stormwater Discharge permit from the RIDEM. This entails submitting a Notice of Intent to be covered under the General Stormwater Permit Associated with Construction Activities and the development and implementation of a Stormwater Pollution Prevention Plan (SPPC). After the project is completed, submit a Notice of Termination to RIDEM to end coverage under the general permit. Contact EHS for guidance for obtaining permits and the development and implementation of an SPPC plan. **If no**, no formal actions required, however typical runoff controls should be put in place (e.g., hay bales etc.) to limit runoff from the site.
10. Wastewater			
	Yes	**No**	**Required Activities**
Does the project site have an existing wastewater discharge permit?	☐	☐	**If yes**, and the project anticipates an increase in wastewater discharge by more than 20% from the site, a new wastewater hook-up permit from the Narragansett Bay Commission (NBC) will be required. **If no**, no further action is necessary.
Does the project include excavation that will require water discharge from the site (e.g., dewatering operations)?	☐	☐	**If yes**, determine the potential location of the discharge, determine whether the sewer line drains to a body of surface water (stormwater line) or to the Narragansett Bay Commission (NBC) sewage system. • If discharging to stormwater sewers, obtain a RIPDES water discharge permit from RIDEM. • If discharging to NBC, apply for a wastewater discharge permit from NBC. Lead time on getting discharge permits can be up to 60 days. Contact EHS for assistance in obtaining permits. **If no**, no further action is necessary.
After completion of the project, will there be wastewater discharge from the site?	☐	☐	**If yes**, determine the potential location of the discharge, determine whether the sewer line drains to a body of surface water (stormwater line) or to the NBC sewage system. • If only Sanitary Wastewater discharge will occur, only an NBC hook-up permit is required. • If other wastewaters will be generated, apply for NBC pretreatment permit. • Discharge of wastewaters through stormwater lines after construction is complete is unlikely to be allowed. If planned, this option Brown will need to obtain a RIPDES discharge permit from RIDEM. Lead time on getting discharge permits can be up to 60 days. Contact EHS for assistance in obtaining permits. **If no**, no further action is necessary.
11. Radiation Safety			
	Yes	**No**	**Required Activities**
Will the project involve the performance of radiography for quality assurance of welds?	☐	☐	**If yes**, contact the EHS Radiation Safety Officer and work with the contractor to ensure appropriate radiation safety protocols are followed. **If no**, no further action is necessary.
Will the project include removing any exit signs that contain tritium as their power source?	☐	☐	**If yes**, contact the EHS Radiation Safety Officer to arrange for the appropriate disposal of these items. **If no**, no further action is necessary.
Will the project be considering the installation of any exit signs that contain tritium as their power source?	☐	☐	**If yes**, contact the EHS Radiation Safety Officer for approval and to coordinate the installation of the signs. These are generally not approved for indoor installation. **If no**, no further action is necessary.

Will the project involve removing or installing any smoke detectors that contain more than 1 micro Curie of Americium-241, or any amount of any other radioactive isotope, used in the detector element?	☐	☐	**If yes they will be installed**, contact the EHS Radiation Safety Officer for installation approval and to coordinate the installation locations of these smoke detectors. These are generally not recommended for routine use. **If yes they will be removed**, contact the EHS Radiation Safety Officer to arrange for the appropriate disposal of these items. **If no the detectors contain less than 1 micro Curie**, the smoke detectors can be installed or disposed of without approval, and no further action is necessary.

APPENDIX C

Construction Site Visitor Policy

Construction Site Visitor Policy

Construction sites can have inherent hazards which require that the University take additional precautions to protect visitors who access the site. This policy was developed to ensure protection of visitors to any Brown University property where construction activities are being conducted. The policy shall be considered to require minimal safety requirements. If visitors are going to access particular areas of a site posing a greater hazard, the visitor may required to wear additional personal protective equipment or take additional measures to protect themselves.

Non-Construction Related Visitors

Non-construction related visitors are defined, for this document, as anyone accessing a construction site whose role is **not** directly related to the construction activities with the site boundaries and their duration on site is limited and intermittent. This will include Brown faculty, staff and students not involved in construction oversight or management, VIP's or other Brown invited guests. Whoever is responsible for organizing a tour should be responsible for ensuring this policy is followed and a sign-in sheet is maintained. While on site these visitors will be restricted to observation of construction processes and/or completion status and be escorted at all times. Whenever possible, these visits should be conducted during periods when construction activities are minimal. The Office of Environmental Health & Safety (EHS) recommends that the following minimum personal protective equipment (PPE) be worn when non-construction related visitors access any construction project.

1. Head protection (hard hats) that meets the requirements of ANZI Z89.1.
2. Eye protection (safety glasses) that meets the requirements of ANZI Z87.1.
3. Appropriate clothing.
   - Long pants & short sleeve shirt.
4. Appropriate footwear.
   - Closed toe & heel design.
   - Slip resistant sole. (rubber soles provide the best slip resistance)

Construction Related Visitors

Construction related visitors are defined, for this document, as anyone accessing a construction site whose role is directly related to the construction activities on site. This will include contractors, project managers, construction managers, architects, engineers, consultants and vendors. These visitors may participate in the construction process by engaging in activities such as inspecting, testing, sampling, or any other activity which requires a specialized skill. The Office of Environmental Health & Safety recommends that the following minimum personal protective equipment be worn when construction related visitors access any construction project.

1. Head protection (hard hats) that meets the requirements of ANZI Z89.1.
2. Eye protection (safety glasses) that meets the requirements of ANZI Z87.1.
3. Appropriate clothing for the task that is being performed.
   - Long pants & short sleeve shirt.
4. Appropriate footwear based on an assessment of hazards that may exist while performing work.
   - Closed toe & heel design.
   - Slip resistant sole. (rubber soles provide the best slip resistance)
   - Puncture resistant sole.
   - Crush resistant toes that are compatible with hazard (i.e., steel toe for general crush hazard and non-steel toe where additional electrical hazards may exist).

For questions regarding this policy or PPE selection please contact EHS at 401-863-3353.