JTL McNew Laboratory

Risk Management and Safety Program

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Introduction

The Texas Transportation Institute (TTI) is committed to providing a safe and healthful work environment for its employees and visitors. All activities and work involve some level of risk to people and property. Many activities involve low level risks of a type and magnitude routinely encountered and accepted as requiring no special measures for mitigation. Other activities may involve increased levels of risks and require additional, appropriate measures be taken to mitigate such risks.

The success of any risk management program is dependent upon each affected person understanding, accepting and adhering to the policies and practices of this program as well as other agency policies and programs.

Purpose

The purpose of this program is to enhance awareness of risk levels in the work environment and limit exposure of personnel and property to the lowest, practical level of risk through philosophy of risk management, training of personnel, engineering controls, and establishment of policies and procedures.

Nature of Work and Related Potential Risk

Work performed within the JTL McNew Laboratory includes, but is not limited to: sample fabrication of pavement materials such as hot-mix asphalt, base, and soils, testing of pavement material, electronics, structural load testing, routine maintenance of testing equipment and many related types of work. Other services performed may include photography of sample fabrication and testing and videography of some research activities for training videos.

The nature of work described above involves increased levels of risk that require additional, appropriate measures be taken to mitigate potential injury to personnel or damage to property.

- Sample fabrication of pavement materials involves some risk of potential injury such as slipping and falling, dropping items on feet, smashing or pinching fingers, burns, cuts and abrasions from sharp objects.

- Testing pavement materials requires working with machines capable of delivering high pressure loads with the potential risk of smashing or pinching fingers.

- Sample fabrication and testing of pavement materials frequently involves lifting and moving heavy objects which can present the potential risk of injury.
Laboratory Procedures

Prior to working in the laboratory, all employees are required to take the following training courses:

1. General Laboratory Safety (which includes Hazard Communication Training)
2. TTI McNew Laboratory Work Area Specific Training

- TAMU Environmental Health and Safety Department (EHSD) provides the “General Laboratory Safety” training course, which includes the Hazard Communication Training. Class attendance can be coordinated through the lab supervisor or lab manager. Each employee is responsible for providing the official certificate noting completion of training to the lab supervisor.

- TTI McNew Laboratory Work Area Specific Training must be coordinated through the lab supervisor. Items included in this training will include but are not limited to:
  1. Hazard communication
  2. Use of personal protective equipment
  3. Location and use of emergency equipment
  4. Proper testing procedures and best practices

All employees working in the laboratory shall be adequately informed of the safety and operational procedures, machinery, equipment, personal protective equipment and best practices to follow when working in the lab.

Unauthorized persons shall not be permitted into the laboratory. Authorized visitors as approved by the lab supervisor or lab manager in the lab shall wear the appropriate personal protective equipment and be informed of potential hazards, location of exits and emergency equipment.

The work area coordinator in charge of each work area shall ensure that the specific safety equipment, including PPE, required on the particular tasks are available and used by affected personnel and authorized visitors. The names of the work area coordinators are posted in their respective areas of responsibility. A list of the work area coordinators is maintained by the lab supervisor.

- Work areas shall be kept clean and free from obstructions. Cleanup should follow the completion of any testing or at the end of each day.

Access to exits, emergency equipment and emergency controls shall never be blocked.

The laboratory shall be equipped with fire extinguishers, eyewash stations and first aid kits.
Emergency telephone numbers should be clearly posted in each work area.

Appropriate personal protective equipment (PPE), including hearing and eye protection, face shields, gloves, aprons and safety footwear shall be used as required. Tests being performed will dictate the required personal protective equipment. Refer to the PPE section in this Program.

Appropriate respiratory equipment shall be used when air concentrations are not sufficiently maintained by engineering controls. The agency safety officer can coordinate respiratory fit testing through TAMU EHSD.

All mechanical equipment shall be adequately furnished with guards that prevent contact with electrical connections or moving parts.

Adequate ventilation shall be provided by use of fume hoods or other ventilation systems to prevent exposure to airborne substances.

Any materials that contain solvents must be heated in a vented oven.

Equipment should have a designated storage place and be returned to that location after use.

Handle and store glassware with care to avoid damage. Do not use damaged glassware.

All bottles, containers and secondary containers shall be properly labeled.

Avoid direct contact with items at extreme temperatures.

Loose clothing or dangling, extended jewelry are not allowed. Long pants and closed-toe shoes are required.

Keep hands and body clear of moving parts.

Use proper lifting techniques when moving equipment and materials.

Use proper gas cylinder and Dewar storage, handling and use practices.

Follow manufacturer and National Electrical Code (NEC) instructions for handling and using electrical devices.

Activities that require the use of a forklift shall be coordinated through the lab supervisor or lab manager. Only employees with current forklift operator certification on file may operate forklifts. Forklift operator certification training should be coordinated through the lab supervisor and agency safety officer.
Hazardous Materials

TTI adheres to hazardous materials procedures established by TAMU EHSD.

All hazardous materials must be handled, used, stored and disposed of in the appropriate, required manner. They must remain in their original container with all labels affixed. Secondary containers must be appropriately labeled and stored.

Material Safety Data Sheets (MSDS) are maintained in binders and located in the corridors adjacent to rooms B09, 122 and 203.

If employees cannot locate a MSDS or notice any potential issues with any hazardous materials or the storage of such materials, they shall contact the lab supervisor immediately.

Appropriate chemical storage cabinets are located in rooms 206, 207, 209 and 210. An acid cabinet is located in room 210.

Hazardous materials commonly used in the lab include, but are not limited to: acetone, batteries, greases, isopropyl alcohol, mercury, oils, solvents, trichloroethylene, and varsol.

Disposal of hazardous materials is coordinated by the lab supervisor through TAMU EHSD.

The lab supervisor shall provide an annual chemical inventory to TAMU for their inclusion, as appropriate, in the TAMU Tier II report as part of the TAMU System.

Personal Protective Equipment (PPE)

Exposure to potential risks can be reduced through the use of appropriate personal protective equipment (PPE).

Each employee is required to follow safe practices to avoid injury to themselves as well as coworkers or authorized visitors. The following sections define PPE requirements for the laboratory.

- All required PPE, except steel toe safety footwear (see section below), and any additional PPE deemed necessary by an employee will be provided upon request to the lab supervisor.

- All employees working in or visiting an area which requires PPE shall wear or use the required items while in that area.
• Employees shall inspect each piece of PPE prior to use for safety, cleanliness and acceptable fit. If an item is not usable or does not appropriately fit, they shall contact the work area coordinator or lab supervisor for replacement of the item.

• PPE items shall be maintained in clean and serviceable condition. Any unserviceable item shall be replaced as soon as possible.

• A supply of appropriate PPE for authorized visitors is maintained in the lab supervisor’s office, room 203.

Eye Protection

Safety glasses with eye shields are for general purpose eye protection and shall be used in operations with increased risk of exposure to flying particles, including but not limited to: certain sample mixing and fabrication procedures, sawing, hammering and most power tool operations.

Employees requiring prescription glasses shall wear goggles/face shields for equivalent protection, unless the prescription glasses are industrial strength safety glass with side shields.

Goggles with direct ventilation are recommended for dusty conditions and may be used for handling powdered substances such as lime or cement.

Goggles with indirect ventilation are recommended when handling liquid chemicals and the potential hazard does not require the use of a face shield.

Ear Protection

Ear protection, full coverage ear muffs or foam ear plugs as appropriate, shall be worn whenever the sound level of an operation nears or exceeds levels with the potential of causing hearing damage.

Ear protection should be in place prior to conducting activities with the potential of causing hearing damage. Some examples are: power saws or other loud equipment such as power tools and air equipment, hammering on metal or in confined spaces or visiting an area where these activities are being performed.

Dust Masks and Respirators

A dust mask should be used for nuisance level dusts and mists that come from sieving for short periods of time, sweeping, or other similar activities.

A cartridge type respirator shall be used for activities that include but are not limited to: sieving for extended periods or pulverizing soils and base materials. Cartridge type respirators shall be used when cleaning and preparing metal plates for overlay testing.
Hard Hats

Hard hats shall be worn in work sites where there is a danger of head injury from impact or falling and/or flying objects.

Employees shall inspect their hard hat prior to wearing to ensure safety, no visible cracks or damage or dry rot of materials.

Safety Vests

Approved safety vests shall be worn by personnel while performing activities where high visibility is needed.

Gloves

Leather gloves shall be worn when handling heavy, abrasive or sharp-edged objects.

Cotton or leather gloves should be worn for light duty material handling.

Heat resistant, insulated gloves shall be worn when handling any materials that will be placed in or removed from an oven.

Safety Footwear – Steel Toe Shoes and Boots

TTI will reimburse authorized employees for their purchase of steel toe safety footwear. Authorization, minimum safety standard requirements and reimbursement procedures are available on the TTINet (intranet).

• Safety footwear shall be worn by employees engaged in material handling work that increases the potential risk of injury to the toe area.

• Safety footwear shall be worn when involved in any activity that increases the potential risk of injury to the toe area.

Asphalt Handling and Storage

Only authorized and trained employees shall be permitted to handle hot asphaltic materials and operate asphalt compaction equipment.

Heating of asphaltic materials constitutes a fire hazard and proper precaution should be used.

Prevent open flames from contacting asphaltic materials or vapors.
• Ensure that work area is free of any obstructions.

• Gloves and face shields shall be worn while pouring hot asphalt. Use only protective gloves, made of non-asbestos material, that are rated for high-temperature usage.

• When working with hot asphalt cement, employees shall wear thermal gloves with the length of glove protection increasing in accordance to increases in the quantity of hot asphalt cement.

• A fully charged 20 lb. UL-rated dry chemical fire extinguisher should be readily available.

• All safety devices and thermostatic controls shall be maintained and kept in good working condition according to the manufacturer or department specification.

• Asphalt shall be stored as far away from other flammable materials as is practical.

**Nuclear Test Equipment**

All use of X-ray equipment, radioactive materials, certain lasers, and other sources of ionizing radiation must be licensed by either the Nuclear Regulatory Commission (NRC), Texas, or another state so authorized by the NRC and also must comply with the requirements of the Texas Regulations for Control of Radiation.

• Personnel using equipment containing radioactive materials must have taken and passed an approved nuclear safety training course. The employee shall provide to the lab supervisor the official training certificate stating that they have passed this course.

• All equipment either producing or containing sources of ionizing radiation must be used in accordance with the manufacturers’ instructions.

• Only equipment with its location specifically stated on the license may be possessed by the laboratory.

• All sources and their respective locations must be reported to the TAMU EHSD Radiation Safety Office.
Fire Prevention

All laboratories shall be equipped with fire extinguishers. Fire extinguishers are designed to control fires of limited size.

- Fire extinguishers shall be conspicuously located and easily identified to ensure they are readily accessible in the event of a fire. They shall be located along normal paths of travel including exit areas.

- Fire extinguishers should not be installed in the area of potential immediate danger.

- Each employee should know how to operate the type of extinguisher(s) installed in their work areas. The lab supervisor can arrange fire extinguisher training through TAMU EHSD.

- TAMU EHSD regularly inspects and maintains all fire extinguishers on their campus inventory.

Passageways, storerooms, and workrooms shall be kept clean and orderly.

Clear passageways shall be maintained to extinguishers and exits.

Careful attention to hazardous materials is required.

- The accumulation of flammable and combustible waste materials and residue shall be controlled so they do not contribute to a potential fire emergency.

- Oily rags, waste, etc., shall be properly disposed of daily in metal cans with covers and appropriately labeled.

- Low flash point liquids are materials such as gasoline, paint thinners, alcohol, ether, and liquid petroleum gas (LPG). Precautions shall be employed where low flash point liquids are stored or used.

- Spilled flammable liquids are to be appropriately cleaned immediately per TAMU EHSD procedures.

- Small containers of flammable/combustible liquids and aerosols are to be stored in dedicated flammable materials cabinets. The cabinets should be designed specifically for flammable storage. The cabinets shall be labeled in conspicuous lettering, “Flammable – Keep Fire Away”

- Flammable storage cabinets shall not be located in an area that might potentially limit means of egress such as an exit, corridor or stairway.
• Maximum capacity of a standard flammable storage cabinet is 60 gallons of Class I or II liquids, or 120 gallons of Class III liquids. Class I liquids are materials such as gasoline and paint thinners. Class II liquids are materials such as diesel or kerosene. Class III liquids are materials such as motor oil. A Class I liquid will be listed on a label as “Flammable,” and a Class II or III liquid will be listed as “Combustible.”

• Flammable liquids shall be appropriately labeled and stored in an “Approved or Listed” container. “Approved or Listed” means a container that has an endorsement such as FM (Factory Mutual) or UL (Underwriters Laboratories) and is metal and self-closing.

Precautions against fire or explosion such as proper ventilation, prohibition of open flames, operation of internal combustion engine driven equipment or operating equipment that produces mechanical or electrical sparks are required.

**Small Spill Response**

When a hazardous material is spilled in the workplace, employees may be exposed to a number of potential hazards. Chemical hazards are classified into several groups, including: flammable, toxic, corrosive, and reactive. An employee should never attempt to clean up a hazardous material spill unless he/she has been properly trained.

A spill shall not be cleaned up by an employee, unless the answer to all of the following questions is **YES**:

• Do you know what the spilled substance is?

• Is it less than 25 gallons?

• Do you have the MSDS for the substance?

• Can it be cleaned in one hour or less?

• If respiratory protection is required, have the employees in charge of the clean-up been properly fit tested for the respirator through TAMU EHSD?

• Do you have the appropriate supplies/equipment required to clean up the substance?

If you answered NO to any of these questions, do not attempt to clean up the spill. Contact the lab supervisor who shall contact TAMU EHSD to determine if the spill meets reportable quantity requirements and for appropriate clean up and disposal of any hazardous materials. The lab supervisor shall contact the agency safety officer to report any spills and EHSD action.
Housekeeping

Good housekeeping reduces the potential for risks and improves productivity, morale, and public relations.

- All areas shall be kept clean and orderly. Housekeeping includes: cleanliness and the orderly arrangement of tools, equipment, storage facilities, supplies and chemicals.

- Housekeeping must be continuous and incorporated into every activity.

- All outside storage areas shall be properly maintained and kept clear of debris. All barrels, lids and rings shall be properly secured to prevent damage to persons or property.

Additional Information

Additional activities outside the usual scope of tests and related preparation or support work or that require use of areas outside the usual, daily testing areas shall be reported to the laboratory supervisor and/or laboratory manager.

Employees shall report all safety concerns or witness of default of safety procedures in others through the following chain of contact; their work area coordinator, laboratory supervisor, laboratory manager, supervisor, program manager, division head or the agency safety officer.

Employees, an event witness or the employee’s supervisor shall complete a “First Report of Injury or Illness” form (available on the TTINet) to report any work site injuries. Only facts, not opinions, should be stated on the form.

Additional workplace safety information may be obtained from the laboratory supervisor or lab manager, agency safety officer or the Texas Department of Transportation (TxDOT) “Handbook of Safe Practices” as related to TxDOT projects.

The agency safety officer can assist with arrangements for personnel safety training in various areas and assist with written safety protocols.

The agency safety officer is responsible for updating and maintaining this plan with commentary from the laboratory supervisor, laboratory manager and the respective division head.