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CNSE Contractor Safety Guide

REVISION

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1 APPLICATION OF THIS GUIDE

This guide is intended for all Contractors, subcontractors and vendors working at the College of Nanoscale Science & Engineering (CNSE). This guide does not contain all OSHA and CNSE safety, health, chemical, environmental and security requirements. It does, however, try to address those requirements that are of particular importance or those that may be overlooked. CNSE requires that Contractors follow the requirements contained in this guide to ensure the protection of personnel and CNSE property. These requirements are in no way intended to supersede the terms, conditions and attachments to any Agreement or Purchase Order between the Contractor and CNSE. Safety, health, environmental and security awareness are fundamental aspects of every activity and must never be compromised.

Field Coordinator (FC) – Your technical liaison for conducting work at CNSE

Questions about the requirements in this guide or the safety of an operation or activity shall be addressed to the Contractor supervisor first, and then the CNSE Field Coordinator (FC). While conducting work on site, the Contractor shall refer to the FC as their main contact for scheduling, coordination of work, and questions about this guide. The FC will periodically check to see if Contractors are in compliance with the requirements contained in this guide and job specifications. Safety, health, chemical, environmental and security violations will result in the work being stopped until the violations are corrected. All costs associated with stopping the work because of violations will be charged to the responsible Contractor. Failure to comply with Federal, State and Local legal requirements, the terms and conditions of the contract, or the provisions listed in this guide may result in the removal of a particular Contractor employee, employees or contracting firm from the project or the approved Contractor list.

CNSE Security (chemical spills, fires, medical emergencies, etc.):

From internal lines call 78600,

From external lines or cell phones use (518) 467-8600

2 DEFINITIONS

CNSE henceforth refers to College of Nanoscale Science and Engineering

Contractor henceforth refers to Contractors, subcontractors, construction managers, general Contractors, vendors, or the owner or employee of any business that is engaged to perform work on CNSE site, whether for tenants or for CNSE. Contractors include, but are not limited to cleaners,

consultants, construction workers (electricians, plumbers, carpenters, etc.), engineers, architects, manufacturer's service representatives, programmers, secretaries, subcontractors, suppliers, technicians, and vendors.

EHS henceforth refers to the CNSE Environmental, Health, and Safety department. EHS oversees fundamental safety aspects of every activity on site. Questions about the requirements in this guide or the safety of an operation or activity shall be addressed with EHS.

FC henceforth refers to the Field Coordinator. The FC is your technical liaison, contract administrator, designated representative, or project coordinator responsible for maintaining technical liaison with the Contractor and for determining the adequacy and acceptability of the work supplied by the Contractor.

3 CONTRACTOR RESPONSIBILITIES

3.1 Contractor Management

Contractor management shall:

1. Ensure employees read, understand and are in compliance with this CNSE Contractors Safety Guide. Contractor shall provide documentation to support compliance upon request.

2. Comply with the OSHA General Duty Clause 5(a)(1), which states: "Each employer shall furnish to each of his/her employees, employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his/her employees."

3. Comply with OSHA 29 CFR 1910 Safety Standards and OSHA 29 CFR 1926 Construction Safety Standards.

4. Obtain all necessary Federal, State and Local required permits, licenses and approvals prior to conducting work at CNSE, including Work Authorization Permits through CNSE. Required CNSE forms can be found under "Contractor Forms and Training" at http://cnse.albany.edu/WorldClassResources/ContractorFormsTraining.aspx

5. Directly supervise and monitor the work of employees, agents and subcontractors.

6. Hold legal liability for the failure of employees/agents/subcontractors to act in compliance with Federal, State and Local, as well as, CNSE requirements.

7. Maintain safety programs to protect employees from hazards through training, procedures and regular inspections.

8. Instruct employees in the recognition and avoidance of unsafe conditions.

9. Provide the tools and equipment for employees to conduct work safely.

10. Hold responsibility for the safety and security of property (e.g., tools, equipment and material).

11. Maintain OSHA 300 records and rates of occupational injuries and provide them to CNSE when asked.

12. Audit the housekeeping of work areas to prevent trip and other safety hazards.

13. Ensure Contractors wear protective equipment.

14. Immediately alert Security and the FC of adverse work conditions, employee injuries and/or property damage.

15. Prohibit alcoholic beverages, controlled substances and weapons on site.

3.2 Contractor Employees

Contractor employees shall:

1. Read, understand and comply with this CNSE Contractor Safety Guide.

2. Comply with applicable Federal, State and Local, as well as, CNSE health and safety codes and regulations.

3. Comply with all emergency alarms and communications.

4. Use only chemical storage containers in good condition to prevent environmental releases.

5. Wear protective equipment and comply with posted safety signs.

6. Wear safety glasses, hardhats, and safety shoes in construction areas, and as directed by the FC.

7. Cone or barricade construction, trip, fall or other hazard areas.
8. Provide signal people and traffic control for roadwork.
9. Report hazardous conditions to your supervisor and the FC.
10. Report medical emergencies & chemical releases to Security, FC & EHS.
11. Limit excessive noise, dust, chemical vapors, spills or flying debris prior to starting the work.
12. Not enter restricted areas without prior authorization from the FC.
13. Not place or lean tools on or against manufacturing equipment.
14. Not use abusive, profane, or sexually explicit language.
15. Conduct live electrical work safely and use Lockout/Tagout (LOTO), whenever possible.
16. Use only portable electrical equipment with a grounded third prong or double insulated.
17. Use extension cords only for temporary power to portable electrical equipment.
18. Use only GFCI-protected extension cords in damp or wet environments.
19. Keep egress paths clear of obstructions for emergency evacuation.
20. Remove from service unsafe or defective equipment.
21. Use proper lifting techniques and ask for help.

3.3 Contractor Forms and Training

Contractor shall obtain Work Authorization Permits while performing work at the CNSE facility. The following policies and procedures must be adhered to. Work requiring the completion of additional permits must be submitted and approved prior to the commencement of work.

For Contractors:
[http://cnse.albany.edu/WorldClassResources/ContractorFormsTraining.aspx]

For CNSE staff, tenants, etc.
[http://intranet.cnse.albany.edu]

4 CLEANROOM REQUIREMENTS

Contractors working for CNSE in manufacturing areas (cleanrooms and core areas) shall abide by the cleanroom work practices outlined in this document and are required to take CNSE Safety Training prior to entering the cleanroom. Contractors shall review and follow CNSE OPS-00001Cleanroom Protocol Requirements and become certified in cleanroom protocols. Since cleanroom requirements may vary from building to building, Contractors shall work directly with their Field Coordinator (FC) for special instructions.

4.1 General Precautions

1. Minimize the potential for product contamination.
2. CNSE will provide the special clothing that Contractors must wear in cleanroom.
3. Contractors shall enter and exit cleanrooms only through authorized doorways.
4. No paper, food, cardboard, beverages or wooden ladders are allowed in cleanroom.
5. The gowning area shall be kept free of trash.
6. Waste plastic and used cleanroom gloves shall be placed in the appropriate waste receptacles.
7. Anytime work activities within a cleanroom space have the potential to affect cleanroom quality specifications with regard to particulate count, vibration, fumes or other contaminants, the Contractor shall review and understand CFM-01005 Dirty Work Permit Procedure and fill out a “Dirty Work Permit”.

4.2 Entering and Exiting the Cleanroom

1. Prior to entering - tools/equipment and carts shall be wiped down with 10% IPA to 90% DI Water.
2. Personal belongings must be secured and jewelry removed.
3. Only enter and exit the gowning room and cleanroom through designated areas.
4. To maximize effectiveness, walk slowly though the cleanroom.
5. Do not exit the cleanroom via unapproved exits except during emergency situations.

4.3 NOT Permitted in the Cleanroom

- Street clothes including caps
- Food or drink
- Cosmetics
- Jewelry
- Smoking
- Candy, gum, lifesavers, mints
- Paper or cardboard
- Pencils or felt-tip pens (only ballpoint pens are permitted)
- Personal items (e.g., lunch, tobacco, erasers, paper towels, eyeglass containers and purses).

4.4 Gowning Procedure and Rules

1. Don shoe covers and if necessary, wash/dry/apply lotion to hands.
2. Don your cleanroom suit in this order: face veil, hairnet, hood, gown, boots and gloves.
3. Put on the disposable face veil first (if facial hair is present) making sure that it is adjusted properly and covers the nose.
4. The headband attached to the veil must be worn above the ears.
5. Remove gowns from their plastic bag only in the gowning area - Do not leave plastic on the floor or benches.
6. Don gown making sure gown does not touch the floor.
7. Place boots on and snap at top, then don gloves.
8. When removing gown, do not tie knots in gown.
9. Do not tie gowns to the racks - hang them properly.
10. Do not use anyone else’s gown or boots.
11. Snap boots to the bootstraps.
12. Place damaged gowns in the repair bin.

13. Place dirty gowns in the proper receptacle.

14. Do not mark gowns.

15. Do not litter in the gowning room.

16. Do not leave boots or gowns on the floor.

4.5 Maintaining Air System Integrity

1. Minimize the loss of cleanroom air - restrictions on dust, dirt, particulate, chemical vapors, temp and humidity.

2. Minimize the disruption of unidirectional airflow.

3. Open one door at a time when entering from gowning area or Wipe-Down Area.

4. Seal wall penetrations and use a cleanroom compatible approved flame sealant when penetrating a firewall.

4.6 Construction Housekeeping Rules

1. Isolate your work area from the rest of the cleanroom with approved anti-static cleanroom Visqueen or as directed by FC.

2. Do not accumulate waste. All wastes shall be removed daily and placed in proper dumpsters.

3. Do not use hand-written or non-laminated signs.

4. Keep your work area clean and neat.

5. Stack and store materials to prevent trip or other hazards.

6. Do not store equipment in front of electrical panels or equipment EMO buttons.

7. Secure stored ladders so they cannot fall.

8. At the completion of work, wipe down the area and remove trash and leftover materials.

9. HEPA vacuum area of work, daily, to remove debris caused by the construction, tool installation or tool removal.

4.7 Removing Raised Floor Tiles

1. Contractor shall review and follow CNSE EHS-00032 Standard Operating Procedure for Floor Tile Removal Procedure.

2. The Contractor is responsible for completion of the Floor Tile Removal Approval Form (EHS-00032-F1), ensuring that the correct barriers, notification, tethers and fall protection devices, if applicable, are in place prior to receiving approval.

3. The removal of raised floor tiles impacts airflow patterns; prior to their removal, obtain approval from the FC.

4. Safety cones or barricades shall be used around floor openings to prevent a falling hazard. Barricade area in sub-fab, if applicable, below the floor tile to be removed.

5. The location and orientation of each tile is unique. Carefully note the position and orientation prior to removing a tile (mark it with cleanroom tape). Replace the tile in the same position when the work is complete.

6. Limit the number of floor tiles to be removed and the duration of their removal.

7. Do not remove tiles from below the raised floor.

8. Do not remove tiles to create new openings to exit from; exit from openings that are already existing (from previously removed tiles), unless in an emergency.

9. Place and store tiles face-to-face since the bottom surface of one tile can damage the top surface of another.

4.8 HEPA Ceiling Filter Removal/Installation

1. HEPA ceiling filters are fragile and easily damaged - prior to their removal obtain approval from the FC.

2. Immediately report any filter damage to the FC.

3. If filter replacement is to be performed during normal cleanroom operations, an approved cleanroom barricade made of anti-static Visqueen shall be installed from ceiling to raised floor to prevent further contamination to product. Remove after completion as directed by FC.

4. Check the condition of filters before and after you complete a job to ensure they were not damaged.

5. HEPA filter shall be scanned by an approved particle counter after installation to assure filter is not damaged and is properly sealed. Document all readings and provide written documentation to FC.

6. Contractors are responsible for the cost of replacing any filters they may damage.

4.9 Preparing Tools & Equipment for the Cleanroom

1. Equipment shall be brought into our buildings to the dock area.

2. Uncrate and remove the first layer of plastic (if two layers), then move it via an approved path to the Wipe-Down Area.

3. Prior to the move, clean floor load distribution (metal) plates and move equipment (e.g., carts, rollers, etc.).

4. In the Wipe-Down Area, remove the last layer of plastic & wipe down the tool/equipment/material with 10% IPA to 90% DI water.

5. In the Wipe-Down Area or any other location dedicated for the equipment move, cleanroom doors must remain closed and only corridor doors can be opened.

6. Wiping pads are folded cleanroom wipes, dampened with the cleaning solution. Do not wring or ball up the pad.

7. Carefully wipe surfaces with the flat pad using slow light strokes in one direction (not an up and down motion).

8. Discard the pad after particulate accumulation is visible. Do not rub or wipe the same area repeatedly.

9. When the wipe down is done off-site, the equipment shall be wrapped with plastic or stored in a plastic bag prior to bringing it into the cleanroom.

10. When equipment wipe down is complete, the cleanroom door may be opened and the equipment moved in. The cleanroom door should be closed immediately afterwards.

11. Cleanroom tape on wheels is not acceptable. All wheel and roller contact surfaces must be in new condition and wiped down before entry into the cleanroom.

4.10 Specific Material Cleaning Requirements

1. All high purity material that is to be used in a cleanroom shall be sealed with double wrapped plastic. The first plastic wrap shall be removed in the Wipe-Down Area. The second wrap shall be removed inside the cleanroom.

2. The interior and exterior of ductwork shall be free of oil and grease. Opened ends shall be wrapped with plastic and cleanroom tape after fabrication and cleaning. The plastic shall not be removed until the duct is ready to be installed.

3. Gas and liquid piping shall be capped at both ends after cleaning. If cleaned off-site, it shall be sealed; double wrapped with plastic in addition to having end caps.

4. Materials that give off particles such as wood, cloth, carpet, bare metal, etc. are not permitted inside the cleanroom or cores. Electro-polished stainless steel, plastic laminates and anodized aluminum are permitted. Epoxy paint or an equivalent material may be used on bare metals depending on the installation and location; this must be approved for use prior to application through the Work Authorization Permit process.

5. Cleaned PVC, CPVC, PVDF, etc. plastics are permitted. Raw steel is not permitted in the cleanroom.

4.11 Moving Equipment through the Cleanroom

1. Keep the tool and moving personnel in the center of the aisle and away from equipment.

2. Slowly remove and install the metal floor load-distribution panels, because their movement generates particles by acting like large fan blades: displacing air and disturbing particulates under the raised floor.

3. Keep panel movement to a minimum to reduce disruption of the air flow.

4. Remove all debris and tool moving equipment as soon as possible.

4.12 Isolating Construction from the Cleanroom Environment

1. Only bring materials into the cleanroom that will be used that day.

2. Do not use un-approved perimeter doors for entry and exit from the cleanroom.

3. Isolate construction work from the cleanroom. Use only non-static approved plastic sheeting (Visqueen), cleanroom tape and other materials.

4. Only approved cleanroom tape is permitted. Any other tape, including duct tape, shall not be used anywhere in the cleanroom or cleanroom sub-fabs.

5. Care shall be taken to remove isolation barrier as to reduce any additional contamination to existing production areas. Place plastic sheeting into a plastic bag and remove from cleanroom.

4.13 Cutting, Sawing and Threading

1. Pre-fabricate materials, as much as possible, outside the cleanroom. Material shall be cleaned with 10% IPA to 90% DI water prior to introduction in cleanroom.

2. Cutting, sawing and threading shall be kept to a minimum in the cleanroom.

3. During cutting or sawing operations, a second person shall be simultaneously HEPA vacuuming the cutting dust.

4. Contractors shall use their own Cleanroom-approved HEPA vacuum to vacuum entire work area at end of each work day and at completion of work.

5. Wipe cleanroom surfaces with 10% IPA to 90% DI Water after vacuuming has been completed.

5 SAFETY REQUIREMENTS

5.1 Working Around Chemicals

With regard to working around chemicals on site, Contractors shall:

1. Review and follow CNSE EHS-00002 Requirements for Hazardous Communication Program and CNSE EHS-00005 SOP for Chemical Handling and Storage prior to handling chemicals on CNSE site.

2. Use chemical labels and Material Safety Data Sheets (MSDSs) to identify the chemical and get information concerning the hazards.

3. Comply with Federal, State, Local and CNSE guidelines regarding chemical use, including but not limited to, OSHA 29 CFR 1910.1200 and 1926.59.

4. Use chemical containers that have the manufacturer's label or the chemical name & hazard warnings.

5. When transferring to a new container, use containers that are compatible with the chemical and labeled.

6. Follow the manufacturer's precautions on the MSDS.

7. Obtain all necessary licenses and permits.

8. Minimize chemical exposure to themselves and others.

9. Supply and use the appropriate protective equipment for the chemical being used.

10. Comply with CNSE protective equipment procedure.

11. Be aware of the nearest eyewash/safety shower prior to working around chemicals.

12. Notify CNSE Security of any chemical incidents.

13. Store flammable/combustible liquids in compatible containers and away from heat sources.

14. Not handle or relocate CNSE chemicals.

15. Transport, store and handle chemicals brought on site according to the manufacturer's specifications.

5.2 Chemical Spills

1. Contractors shall not discharge or release hazardous materials or chemicals on CNSE property. A release is defined as any unplanned release, leaking, pumping, pouring, emitting, dumping, discharging, emptying, or disposing of a hazardous material or chemical, including wastewater and chemically-treated water.

2. Contractor equipment found to be leaking should be immediately contained and repaired, and the FC notified. All costs associated with cleanup of the leak will be the sole responsibility of the Contractor.

3. Unreported spills, discharges and releases are a violation of federal, state and local regulations and can lead to termination of work privileges at CNSE.

4. If a chemical or unknown liquid is spilled or released, the Contractor shall immediately call Security.

5. Contractors shall identify the chemical and the cause of release, as well as, the building, floor and column location.

6. With authorization from EHS, the Contractors shall clean up the release, if approved to handle the chemical spill.

7. The release shall be cleaned to CNSE's satisfaction. CNSE maintains the right to arrange for cleanup by an outside party and to collect the associated cleanup costs from the Contractor.

5.3 Housekeeping

1. Materials shall not be stored outdoors without prior approval by the FC.

2. Scrap lumber, metal, or other garbage shall be disposed of as directed by the FC.

3. Protruding nails or wires shall be removed or bent over to prevent injuries.

4. Walking surfaces shall be free of slip, trip and fall hazards by keeping the area clean and free of obstructions.

5. Floor or trim anchors shall be cut flush with the floor surface to prevent trip and fall hazards.

6. Broken glass shall be placed into containers specifically designated for broken glass.

7. Platform planks shall be removed immediately after the work is finished.

8. Minimize production of odors, noise, dust, dirt and debris into adjacent work areas.

9. CNSE equipment and facilities shall be protected from flying or falling materials.

10. Tarps shall be flame resistant, asbestos free and in good condition.

11. At the end of the work shift and during the work day, to prevent dust from migrating into hallways and other occupied areas, vacuum carpets and mop tiles.

12. Equipment, chemicals, construction material and debris shall be removed from the area at the end of each work day.

13. Work areas shall be clean and free of debris at the end of the shift and when the job is finished.

5.4 Office Safety

1. Stairwell doors and other fire doors shall not be propped open.
2. Care shall be taken not to damage finished work.
3. Materials shall be organized and not pose a trip hazard or block doors or walkways.
4. Materials shall not be stored in stairwells.
5. Materials shall not be stored over a work area.
6. Office construction shall have a separation wall in compliance with OSHA and be maintained throughout work. Separation system shall match wall-fire ratings with minimum of one-hour rated walls and, if access is required, ¾-hour rated doors.

5.5 Toxic Gas Monitoring System (TGMS)

1. Contractors shall review and follow CNSE EHS-00031 – Procedure for Toxic Gas Monitoring System Operation and Maintenance.
2. All Contractors installing TGMS components at the CNSE facility should use Section 6.0 through Section 17.0 to ensure all components are installed in accordance with criteria set forth by CNSE EHS department.
3. All new and/or changes/edits to any AAC panels are required to have the complete, up-to-date as-built drawings installed within the AAC panel itself no later than two (2) weeks after EHS has signed off on TGMS testing.
4. TGMS testing is allowed M-F during normal business hours if TGMS BLUE LIGHT BYPASS IS ACTIVE and ERT/EHS member is monitoring TGMS system during entire TGMS test. If an additional BLUE LIGHT system is needed, testing will be required ONLY before 8:00 AM or after 5:00 PM Monday through Thursday.

5.6 Parking

Contractors shall park in lot “F”. Parking is not allowed in fire lanes, on hash marks or any other permit parking areas. Docks may be used to load and unload equipment necessary to perform duties and then vehicles must be immediately moved. All vehicles must adhere to site-designated speed limits and traffic control signs. Parking Rules and Regulations are available at CNSE Security located in the NFE rotunda.

5.7 Permits

Contractor is responsible to obtain all necessary “Work Authorization Permits” and any required sub-permits for work on CNSE site, as well as, required permits through Federal, State and Local governments. See Part 1c Contractor Forms and Training for further information.

Contractor shall obtain all necessary inspections and provide reports and electrical inspections to FC for CNSE records. CNSE permits will list required inspections and reports.

5.8 Bulk Chemicals and Gases

1. Certain bulk chemical and gas storage and delivery systems are subject to the requirements of OSHA 29 CFR 1910.119 - "Process Safety Management of Highly Hazardous Chemicals."

2. Any work on bulk chemical or hazardous gas storage and delivery systems including pipelines shall be approved by and coordinated with the FC.

3. Work on any chemical and gas storage and delivery systems requires an approved Work Authorization Permit.

4. Contractor management shall ensure compliance with the OSHA Process Safety Management (PSM) requirements including, but not limited to, documenting appropriate employee training, hazard awareness and safe work practices.

5. Contractors shall comply with OSHA PSM requirements when performing maintenance or repair, major renovation or specialty work on or adjacent to a covered process.

5.9 Potentially Hazardous Areas

1. Certain areas and operations at CNSE sites may have potential hazards associated with them. Contractors shall take extra precautions when working in, on or around such areas. These areas include, but are not limited to: HPM dispense rooms, storage rooms & warehouses; chemical labs; confined spaces (e.g., tanks, manholes, vaults, pits, etc.); electrical circuits/equipment; high noise level areas; high voltage electrical areas; ionizing and non-ionizing radiation labs; laser labs and areas; mechanical equipment rooms; roofs, service cores and storage; dispensing; and process areas for chemicals and gases.

2. Contractors shall review all projects to determine the hazards associated with the work and surrounding area and review hazards with their workers.

3. Upon the Contractor's request, the FC will provide information regarding potential CNSE generated hazards.

4. Contractors shall provide the equipment, procedures and training necessary for their employees to perform the work safely.

5. Contractors shall honor all warning signs, signals and devices (e.g., laser signs and lights, radiation signs, protective eyewear signs, etc.) unless authorized to do otherwise by their management or the FC. Note: The only permissible reason to disregard a warning device is if it has been proven to be defective.

5.10 Security

1. CNSE Security reserves the right to conduct random searches of personal or other property carried onto or off of CNSE premises including vehicles, handbags, lunch boxes, backpacks, briefcases, etc. Anyone refusing to participate in the search process will be brought to the attention of the FC.

2. Contractor supervisors shall notify the FC of the work plan, location, crew size and expected start time.

3. Contractors shall sign in and obtain an identification badge.

4. Contractors shall prominently display their identification badges at all times.

5. Contractors shall scan the temporary badges at the NFE Security office kiosk when leaving CNSE facilities at the completion of the work shift, and return the lanyard and clear pocket prior to leaving site.

6. Contractors who invite additional workers or venders, who are temporary in nature, must check them in at CNSE Security and provide them with an escort at all times.

7. Contractors shall control access to CNSE areas by:

   a. only admitting persons with valid identification badges into CNSE buildings,

   b. directing persons without badges to Security to gain access,

   c. not lending a badge to another person,

   d. entering and exiting through designated doors only,

   e. not defeating locks or latches,

f. leaving doors closed and locked,

g. not propping doors open unless they are attended, and

h. securing temporary openings in walls, roofs or floors to prevent unauthorized access.

5.11 Smoking

1. No smoking inside CNSE buildings or on any rooftop.
2. No smoking in restricted areas or where “no smoking” signs are posted.
3. Smoke only in approved smoking areas. No smoking within 15 feet of building entrances.
4. Dispose of cigarettes in appropriate receptacles, not in trash containers or on the ground.

5.12 Utilities

1. Contractors shall notify the FC if an appropriate source of utilities is not available in the work area.
2. Utilities may not be run through a doorway which is normally locked to maintain security unless the doorway is continuously monitored by the Contractor to control unauthorized access.
3. Contractors may supply a safe, temporary electric source that is compliant with the National Electric Codes (NEC) and is GFCI protected.

5.13 Commissioning

1. Contractor shall review and understand CNSE EHS-00016 Procedure for New Equipment and Process Change Management and CNSE EHS-00017 Procedure for Equipment Commissioning prior to any equipment commissioning on CNSE site.
2. Ensure that all equipment commissioning projects within the scope of this procedure are designed and installed in a manner consistent with applicable codes, regulations, and sound engineering practices.
3. Address safety, health and environmental concerns related to the design, installation, startup, operation and maintenance of equipment within the scope of this procedure.

4. The tool owner requesting permission to install a tool in the CNSE Facilities will complete the Equipment Commissioning Checklist (EHS-00017-F1) ensuring completion of each checklist item.

5. The designated CNSE personnel from the EHS and Facilities Operations Group Departments will review and approve the checklist and required documentation in order to begin/initiate the installation process.

6. Once the equipment is set, leveled, and electrical and facilities connections are made, a review of the installation to that point will be performed using the Part 1 Checklist.

7. Upon completion of the Part 1 Checklist, electrical power, non-HPM gases, liquids and vacuum, may be supplied to the equipment.

8. The Part 2 Checklist is used to verify that the equipment is ready for HPM use and other hazards (i.e. radiation, laser, mechanical hazards, etc.) associated with the equipment are ready to be energized. Upon completion of the Part 2 review, the equipment may be approved to become fully functional, and is released for process qualification and commissioning for use at CNSE Facilities.

9. Any deficiencies that are discovered during the Part 1 and Part 2 reviews that do not directly impact the safety of the equipment or the installation are to be listed in the Punchlist at the end of the Equipment Commissioning Checklist. Punchlist items should be completed in a timely manner and must be completed before the checklist is signed off.

5.14 Decommissioning

1. Contractor shall review and follow CNSE EHS-00030 Policy for Equipment Decommissioning prior to any equipment or support systems decommissioning on CNSE site.

2. Ensure all equipment decommissioning/removal and support systems decommissioning/removal are executed in a manner consistent with applicable codes, regulations and sound engineering practices.

3. This process ensures that equipment is decommissioned or removed in a manner that will allow lowest possible risk to employees, operations or maintenance activities.

4. Proper personal protective equipment must be worn at all times when decontaminating equipment.

5. Consult the MSDS before conducting decontamination to better understand the hazards and needed precautions for chemicals involved. MSDS binders are located in the cleanroom gowning areas.

6. All hazardous waste materials generated from decontaminations must be properly handled as hazardous wastes in accordance with Hazardous Waste Management Plan.

7. Some decontamination work may require the use of a cartridge or airline respirator.

8. All sources of harmful energy must be locked out and tagged out to prevent accidental start-up or release of liquids/gases.

9. Any questions regarding decommissioning procedures, use of personal protective equipment, chemical hazards, and waste disposal should be referred to the EHS Department site contact: Robert Segura 437-8627 or rsegura@albany.edu.

5.15 Decontamination

1. Contractor shall review and follow CNSE EHS-00037 Procedure for Equipment Decontamination prior to any equipment decontamination on CNSE site.

2. Ensure all equipment and support systems are decontaminated in a manner consistent with applicable codes, regulations and sound engineering practices.

3. This process ensures that equipment is decontaminated or removed in a manner that will allow lowest possible risk to employees, operations or maintenance activities.

4. In conjunction with obtaining and posting the Equipment Decommissioning/Removal Safety Sign-off Checklist at or near the subject equipment, the CNSE, Tenant, Contract or Sub-Contract Equipment Engineer is responsible for performing the appropriate decontamination procedure, in a safe and timely manner, and disposing of materials generated appropriately.

5. Proper personal protective equipment must be worn at all times when decontaminating equipment.

6. Consult the MSDS before conducting decontamination to better understand the hazards and needed precautions for chemicals involved.

7. All hazardous waste materials generated from decontaminations must be properly handled as hazardous wastes in accordance with Hazardous Waste Management Plan.

8. Some decontamination work may require the use of a cartridge or airline respirator.

9. All sources of harmful energy must be locked out and tagged out to prevent accidental start-up or release of liquids/gases.

10. Any questions regarding decontamination procedures, use of personal protective equipment, chemical hazards, and waste disposal should be referred to the EHS Department site contact: Robert Segura 437-8627 or rsegura@albany.edu.

11. ANT, Tenant, Contract or Sub-Contract employees can perform tool decommissioning of tools so long as the following training courses have been completed and are up to date:

    - General Safety,
    - Chemical Safety,
    - Hazardous Waste Handling,
    - Hazardous Gas Handling (for tools involving toxic gases),
    - Respirator Safety (if a respirator must be used),
    - Lock-out/Tag-out Safety.

12. Be sure to follow EHS Decontamination procedures for the following:

    - Diffusion furnaces
    - Photoresist spin tracks and developers
    - Etchers and ashers
    - Chemical vapor deposition systems
    - Ion implanter
    - Sputters
    - Ovens
    - Wet pumps

- Dry pumps
- Acid sinks
- Stripper sinks
- Solvent sinks
- Lead contaminated equipment
- Process gas lines
- Acid drain lines
- Exhaust ventilation ducting
- Floors, walls, trenches
- Gas cabinets
- Spin rinse dryers (SRD)
- Tube cleaners

6 CONSTRUCTION SAFETY

6.1 Chemical Use

With regard to the use of chemicals on site, Contractors shall:

1. Review and follow CNSE EHS-00002 Requirements for Hazardous Communication Program and CNSE EHS-00005 SOP for Chemical Handling and Storage prior to handling chemicals on CNSE site.
2. Comply with Federal, State, Local and CNSE guidelines regarding chemical use - not limited to OSHA 29 CFR 1910.1200, and 1926.59.
3. Report all chemicals proposed to be used on a project to the FC.
4. Some chemicals are restricted from the site. Contractor shall complete and submit the Chemical Authorization Form (EHS-00002-F1) and the associated MSDS, to the EHS Department for review and approval.
5. Use non-hazardous materials whenever possible. CNSE can prohibit the use of certain chemicals.
6. Use chemical containers that have the manufacturer’s label or the chemical name & hazard warnings.

7. Follow the manufacturer's precautions on the MSDS.
8. Obtain all necessary licenses and permits.
9. Minimize chemical exposure to all.
10. Supply and use the appropriate protective equipment for the chemical being used.
11. Comply with CNSE protective equipment signs.
12. Be aware of the nearest eyewash/safety shower prior to working around chemicals.
13. Notify CNSE Security of any chemical incidents.
14. Provide temporary exhaust to control solvent fumes and odors when paints, solvents or volatile chemicals are used.
15. Keep chemicals in closed containers when not being used.
16. Store flammable/combustible liquids in compatible containers and away from heat sources.
17. Remove flammable liquids from the site at the end of the work shift unless approved by the FC.
18. Not store flammable liquids/gases with combustible materials (e.g., wood, paper).
19. Not store incompatible chemicals together (e.g., oxidizers and flammables).
20. Obtain approval from the FC for overnight storage of chemicals and chemical waste.
21. Place materials with flammable liquids on them in the “Flammable Waste” container.
22. Not dismantle or move chemical pipes, exhaust hoods, ductwork, or tanks without prior approval of the FC.
23. Properly decontaminate chemical materials and equipment prior to starting work.
24. Transport, store and handle chemicals according to the manufacturer’s specifications.
25. Remove all chemical supplies from the site at the completion of the job.

26. Label all chemical drains, collective systems, facility and process plumbing as to their contents and direction of flow. Labels shall be placed every 10ft, at all branches and before and after all penetrations.

6.2 Compressed Gases & Compressed Gas Cylinders

1. Contractor shall review and follow CNSE EHS-00011 Gas Cylinder Handling Procedure prior to handling any gas cylinder on CNSE site.

2. Compressed air/gas shall not be used for cleaning purposes except where reduced to less than 30 psi, and then only with effective chip guarding and protective equipment.

3. Compressed air/gas shall not be used to clean dust from an individual's clothes or body, nor shall the nozzle be pointed at people.

4. Proper pressure control hardware, Compressed Gas Association (CGA) fittings and rated delivery lines shall be used at all times.

5. Compressed gas cylinders shall be legibly marked (stenciled, stamped or tagged), according to the current ANSI standards, with the name of the material contained.

6. The Contractor's company name shall be identified on any cylinder that is not removed from the site at the end of the work shift.

7. The proper Compressed Gas Association (CGA) fitting shall be used. Adapters are not permitted.

8. Gas cylinders that are damaged or contain a buildup of scale or rust shall not be brought on site.

9. Hose lines shall be properly rated, regularly inspected and tested for leaks.

10. If a leak develops in a cylinder, immediately clear affected people from the area and call CNSE Security

11. Contractors working with or transporting compressed gases shall have appropriate safety training in the use and handling of compressed gases and cylinders through their employer.

12. When transporting cylinders, Contractors shall:

    a. install valve protection caps,

    b. secure to an approved hand truck or cart,

c. never carry the cylinder by the bottle valve, regulator or protective cap,

d. never roll or drag a cylinder - use an approved cart,

e. never drop or allow a cylinder to strike other cylinders or surfaces,

f. only use the freight elevators for vertical transportation, when available,

g. either cradle or have two persons carry the cylinder when transporting to the roof or basement, or between floors (if not on a freight elevator).

13. Ensure that all compressed gas cylinders, whether in use, in transit, or in storage, are fastened securely in an upright position by a chain, suitable strap, or a rigid retaining bar or structure. In cases where more than one cylinder is to be stored, the cylinders shall be installed in an upright position in a cage or rack constructed to protect the cylinders from falling. The cage or rack must be capable of preventing movement on three sides. The open side shall have a removable restraint(s), such as a chain, suitable strap or rigid retaining bar, which can be adjusted to prevent cylinders from falling. In all cases the cylinders shall be secured to prevent them from falling or sliding out from under the restraints.

14. Protective valve caps shall always be installed on stored cylinders or when transporting cylinders.

15. Cylinder valves shall be closed when not in use and at the end of the day's work. Torch valves shall not be relied on for cylinder shut off.

16. Regulators shall be approved for the specific compressed gas being used. They shall not be interchanged.

17. Compressed gas cylinders shall be used in well-ventilated areas or within mechanically ventilated cabinets.

18. Cylinders shall be kept far enough away from welding or cutting operations so that sparks, hot slag or flame will not reach them. When this is impractical, fire resistant shields shall be provided.

19. Cylinders shall not be placed where they could contact an exposed electrical circuit.

20. All cylinders shall be removed from the site daily.

21. Cylinder status tag shall be placed on all cylinders noting full/empty/or in use.

22. The FC shall authorize any overnight storage of a gas cylinder.

23. Acetylene cylinders shall not be transported, used or stored with the cylinder lying down because this could result in the release of flammable liquid. If such a release occurs, immediately call CNSE Security.

24. Oxygen cylinders must be stored separately from acetylene cylinders in a well-protected, well-ventilated, dry location, at a minimum distance of 20 feet, or behind a non-combustible barrier at least 5 feet high, having a fire resistance rating of at least a half-hour.

25. Contractor shall wear appropriate PPE when handling and using different types of gas. Refer to EHS-00011 CNSE Gas Cylinder Handling Procedure.

26. Do not use acetylene at more than 15psi gauge pressure.

27. Contractors shall obtain approval from the FC before bringing a compressed gas on site.

6.3 Confined Spaces

1. Contractor shall review and follow CNSE EHS-00007 Entry Procedures for Confined Spaces prior to entry into a confined space on CNSE site.

2. A confined space is defined by OSHA as

   a. large enough that an employee can bodily enter & perform work,

   b. has limited or restricted means for entry or exit, and

   c. is not designed for continuous employee occupancy.

3. A permit-required confined space contains one or more of the following:

   a. a potentially hazardous atmosphere,

   b. a material that has the potential to engulf an entrant,

   c. an internal shape that could trap or asphyxiate, and

   d. any other serious safety or health concern.

4. All confined spaces on site are permit-required.

5. All confined spaces have a sign stating “PERMIT REQUIRED CONFINED SPACE, DO NOT ENTER”.

6. Confined spaces include, but are not limited to manholes, tanks, pits, vaults, boilers, or excavations.

7. Contractors shall not enter any confined space without the authorization from EHS and the FC.

8. Contractors shall comply with all the requirements of OSHA 29 CFR 1910.146 - "Confined Space."

9. Contractors shall have a written confined space program submitted to CNSE EHS and on site at all times.

10. Contractors shall be prepared to show evidence of appropriate confined space training.

11. Contractors shall provide their own atmospheric testing equipment.

12. Prior to entry, the entry supervisor shall hold a pre-entry meeting and review the entry permit.

13. Confined space covers and doors shall be opened and maintained clear of obstructions during an entry. Suitable barricades shall be placed around open confined spaces.

14. A confined space must be removed from service and completely protected against the release of energy and materials into the space.

15. Confined spaces shall be clean and free of hazardous materials or chemicals and, where necessary, purged with water or other equivalent means. Disposal of materials shall be in a manner authorized by the FC.

16. All hazardous energy sources shall be isolated and controlled via Lockout/Tagout procedure. Examples of energy sources are electrical, mechanical, hydraulic, pneumatic, chemical, and thermal.

17. Prior to entry, the atmosphere in the confined space shall be tested for oxygen, flammable gas and potential toxics. Monitoring of the confined space shall be done on a continuous basis while working inside the space.

18. All confined spaces shall be ventilated by the use of a positive pressure ventilation system arranged to avoid recirculation of contaminated air. At least one trained attendant shall be required to remain at the confined space entrance during an entry.

19. Contractors shall supply their personnel with all equipment, PPE, communication devices and training required for an entry.

20. Pressurized cylinders shall not be brought into confined spaces (except SCBA). All hoses and lines connecting gas cylinders shall be shut off at the cylinder and removed from the space when not in use.

21. Entry team members shall be trained to the appropriate level for the work they are performing (e.g., entrant, attendant or supervisor).

22. If any unforeseen hazardous conditions are encountered during entry, the confined space shall be evacuated and the FC notified immediately. The permit is automatically terminated at the time of evacuation.

23. Upon completion of the entry, the Contractor shall notify the FC and/or the permit issuer that the entry is complete, so the permit can be closed out.

6.4 Electrical Safety – Lockout/Tagout (LOTO)

1. Contractors who maintain or service equipment where the unexpected start-up may cause injuries shall develop and use a written Lockout/Tagout (LOTO) program that complies with OSHA 29 CFR 1910.147, and review and understand CNSE EHS-00008 Standard Operating Procedure for Lockout/Tagout.

2. Contractors shall provide their written LOTO Program to the FC prior to starting work.

3. Contractors who lockout tools shall follow the LOTO Procedure on each tool.

4. Basic steps to LOTO equipment:

   a. prepare for shutdown,

   b. notify of affected employees,

   c. shutdown the equipment by normal shutdown means,

   d. isolate the equipment by locking out all hazardous energy sources – apply LOTO lock,

   e. dissipate any stored energy - block and lock,

   f. verify isolation with a voltmeter and other means,

   g. place tag and lock on each disconnecting mean that is used to de-energize the equipment to be worked on,

   h. insure the tag has your company name, employee name, and the date and time it was disconnected and phone number.

i. verify that the equipment or machine cannot be restarted and return controls to off position,

j. proceed with work.

5. Basic steps to release equipment from LOTO:

   a. inspect tool or equipment to make sure it is in the off position,

   b. remove electrical tools and equipment,

   c. notify affected employees that you will be re-energizing the equipment,

   d. ensure all persons are clear of equipment,

   e. remove LOTO locks and other devices, and

   f. return tool to normal operation.

6.5 Electrical Safety – Working Live

1. Contractor and/or vendor shall read and understand CNSE EHS-00054 Procedure for Electrical Safety Program prior to commencement of work.

2. All activities must be conducted in accordance with the applicable parts of the Occupational safety and Health Administration (OSHA) 1910 Subpart S - Electrical for General Industry and 1926 Subpart K - Electrical for Construction.

3. If the FC agrees that de-energizing exposed live electrical parts introduces additional hazards such as interruption to life support systems, complete removal of light to an area, deactivation of emergency alarms system, deactivation of hazardous location ventilation equipment, or is not feasible, specific safety-related work practices for working live shall be followed by qualified Contractor personnel.

4. Work practices include the use of precautionary techniques, protective equipment, insulating & shielding materials, insulated tools, etc.

5. Work practices shall be suitable for work conditions and the exposed voltage level.

6. Work practices shall protect against direct body contact or indirect contact by means of tools or materials.

7. Suitable barricades and warning signs shall be used to make any necessary open wiring inaccessible to unauthorized personnel.

8. Energized panels shall be covered when not attended.

9. Temporary wiring shall be de-energized when not in use. All temporary wiring must be protected by a GFCI.

10. Entry into high voltage areas shall be pre-authorized and supervised by the FC.

11. If conductors and wires need to be left temporarily exposed, they shall be de-energized, insulated and positioned so as not to cause physical hazards.

12. Unused openings in electrical panels shall be appropriately covered.

13. Conductors entering equipment or electrical panels shall pass through grommets to protect from abrasion.

14. Listed, labeled or certified equipment shall be installed and used in accordance with the instructions included in the listing, labeling or certification.

15. Contractor shall re-install covers to panels and label circuits appropriately.

6.6 Equipment – Explosive-Actuated Tools

1. In the event that the work is to take place in or adjacent to an occupied space, the Contractor and/or vendor shall review and follow CNSE EHS-00065 Procedure for Power-Actuated Fastener Tool Permit. Include permit with Work Authorization Permit for approval prior to use. CNSE EHS and FC will review the checklist on the permit with the Contractor prior to signatures for approval.

2. Explosive actuated tools shall be inspected, handled and used in compliance with OSHA 29 CFR 1926.302, 1910.243 and ANSI A10.3, “Safety Requirements for Explosive Actuated Fastening Tools.”

3. Only employees who are licensed/certified and trained in their operation shall operate explosive-actuated tools.

4. The type and size of fastener to be used shall be compatible with the type and size of material that the fasteners are to be driven into.

5. Explosive actuated tools shall not be used in explosive or flammable atmospheres.

6. Explosive actuated tools shall not be loaded until just prior to the intended firing time.

7. Loaded explosive actuated tools shall never be left unattended.

8. Explosive actuated tools shall never be pointed at anyone.

9. Area shall be cordoned off when in use to prevent unauthorized access.

10. Spent and misfired cartridges must be disposed of in accordance with manufacturer's instructions and not disposed of in CNSE dumpsters.

6.7 Equipment – Hand and Portable Electric Tools

1. Portable electric equipment shall be inspected and handled according to OSHA 29 CFR 1910.334 and 1926.302.

2. Portable electric equipment shall be double insulated or electrically grounded by a grounding conductor plug, and GFCI protected.

3. Portable electrical equipment shall be kept in good repair and have attachment cords that comply with the applicable requirements for extension cords.

4. GFCI devices shall be used on power circuits serving outlets in damp, wet or outdoor locations.

5. Contractors shall not use defective or unsafe equipment.

6. Contractors shall use only non-sparking equipment in flammable solvent handling and non-sparks areas.

7. Contractors shall use the manufacturer's recommended shields, guards and attachments.

8. Contractors shall inspect equipment guards prior to each use.

9. Contractors shall not leave tools or other materials on stepladders, scaffolds, roofs or other high places.

10. Appropriate protective equipment shall be worn/used when using tools.

6.8 Equipment – Pneumatic Tools

1. Any proposed use of pneumatic tools shall be approved by and coordinated with EHS and the FC.

2. Pneumatic tools shall be inspected, handled and used in compliance with OSHA 29 CFR 1926.302 - "Power-Operated Hand Tools".

3. Compressed air shall be turned off when the tool is not in use.

4. The manufacturer's safe operating pressure for all fittings and hoses shall not be exceeded.

5. Pneumatic tools shall be secured to the hose in a positive manner to prevent accidental disconnection.

6. All hoses exceeding ½-inch inside diameter shall have a safety device at the source of supply to reduce air pressure in case of hose failure or tool disconnection.

7. Safety clips or retainers shall be securely installed and maintained on pneumatic impact tools to prevent attachments from being accidentally expelled.

6.9 Equipment – DI Water Test Cart

It is the contractors' responsibility to ensure that the Water Test cart is free of residual peroxide when performing leak checks.

The two acceptable methods are as follows:

1. Have a cleaning/ flushing water test cart procedure to be performed before every leak check

   or

2. Have two water carts: the first dedicated to leak checks where peroxide is NEVER introduced and the second dedicated to the sanitization of the line.

Please Note: The TGMS sensors are cross–sensitive to peroxide. Every precaution is needed to ensure that peroxide is not released into the cleanroom because it has the potential of causing a false blue light evacuation.

6.10 Excavation and Trenches

1. Excavations include, but are not limited to, operations such as digging, drilling and trenching.

2. Excavation equipment and work shall comply with Federal, State and Local legal requirements including, but not limited to, OSHA 29 CFR 1926, Subparts M, O and P.

3. Excavation work shall be approved by and coordinated with the FC. An excavation permit may be required for excavation work within or outside of buildings.

4. Excavations below the base of footings of any foundation or retaining wall shall not be permitted without prior approval of CNSE Facilities Engineering.

5. Before starting any excavation work, the existence and location of underground pipes, electrical conductors, gas lines, etc. shall be determined. A sub-surface scan may be required prior to any digging along with NYS Dig Safe to establish any possible services in area. Contractors shall contact the FC to obtain any available existing drawing(s) as a guide to existing services underground.

6. Contractors shall wear/use protective equipment as appropriate for the work performed. Where exposed to public vehicular traffic, employees shall wear orange or red warning garments. Warning garments worn at night shall be of reflective material. Contractor shall provide signal people to direct traffic.

7. The sides of the excavation shall be protected against hazardous ground movement and:

    a. excavations more than 5 feet deep, shall be shored, braced, sloped or benched to prevent any hazardous ground movement, or

    b. excavations more than 20 feet deep, shall be shored, braced, sloped or benched as designed by a registered professional engineer.

8. Shoring or sheet piling shall be in compliance with Local, State and Federal standards.

9. When excavations are deeper than 4 feet, ladders or steps shall be located so that a worker does not need to travel more than 25 feet in any direction before being able to exit the excavation.

10. Dirt, debris and other material shall be stored and retained at least 2 feet from the edge of any excavation that personnel may enter.

11. If it is necessary to place or operate power shovels, derricks, trucks, material or other heavy objects at a level above and near an excavation, the side of the excavation shall be sheet piled, shored, and braced, as necessary, to resist the extra pressure due to such superimposed loads.

12. Any liquid entering excavations that require dewatering shall be removed in a manner approved by the FC.

13. Adequate barrier physical protection shall be provided at all excavations and trenches. In vehicular traffic areas, warning lights shall be placed

next to excavations and trenches during evening and night hours to provide sufficient warning of danger.

14. Daily inspections of excavations, the adjacent areas, and protective systems, shall be made prior to the start of work and as needed throughout the shift. If evidence of possible cave-ins or other hazardous conditions are apparent, all work in the excavation shall cease until the necessary precautions have been taken to safeguard personnel and to correct the situation.

15. Certain excavations may be considered confined spaces.

16. Bridges and walkways over excavations shall be in compliance with Federal, State and Local legal requirements including, but not limited to, OSHA 29 CFR 1910, Subpart D - "Walking-Working Surfaces" and/or 1926, Subpart M - "Fall Protection".

17. Bridges and walkways shall:

    a. be free of splinters, protruding nails or other protrusions that might cause injury,

    b. be slanted to ground level on both ends, and

    c. have a rise no greater than 1 foot over a 12-foot run, have a non-slip surface, which is even, secured, and does not create a tripping hazard.

18. Guardrail systems shall be present on all sides of bridges and walkways and:

    a. have a top rail that is 42 inches above the platform and capable of withstanding a 300-pound push against the center of the rail,

    b. have a mid-rail that is 21 inches above the platform, and

    c. have a toe-board that is 4 inches high if work will be performed or pedestrians will pass below the bridge or walkway.

19. Pedestrian bridges shall be able to withstand the maximum intended load of a 300-pound weight, which when placed at the center of the bridge, shall not cause a bending greater than ½ inch.

20. Material handling bridges shall be able to withstand twice the maximum intended load, which shall never be less than 300 pounds.

21. Material handling bridges shall have construction netting extending from the top railing to the bridge floor.

22. Material handling bridges shall be designed so that the guardrail system prevents material and handling devices from falling from the bridge. This may be accomplished by having a solid 42-inch high barrier on both sides able to withstand an impact by the maximum intended load without failing, or an inner barrier that prevents the material handling unit from impacting the guardrail system.

23. Contractor must have a competent person assigned to all work.

6.11 Exhaust Systems

1. Any proposed work on exhaust systems shall be approved by submitting a Work Authorization Permit & obtaining approval by CNSE Building Mechanical Engineer. Work shall be coordinated with the FC.

2. Exhaust systems work includes, but is not limited to:

   a. shutting off an exhaust system,

   b. entering an exhaust plenum,

   c. modifying exhaust flows and or static pressure,

   d. blocking, puncturing or removing an exhaust system, and

   e. interrupting electrical service to an exhaust system.

3. If photohelic exhaust set points are moved from their approved minimum and/or maximum position, they are to be returned to their proper position upon completion of work, or prior to leaving the work area. The FC should be informed if the work has altered the approved exhaust flow/static or velocity pressure. This includes work associated with balancing and testing systems, as well as all other exhaust systems work.

4. All work shall be balanced by an approved balancer and all drops shall be labeled. Any out of spec conditions existing prior to or during work shall be documented and brought to the attention of the FC prior to completion of work for resolution.

6.12 Extension Cords

1. Ground Fault Circuit Interrupt (GFCI) devices are required for all construction areas & temporary wiring installations that are used during maintenance, remodeling or repair of buildings, structures, or equipment or during similar construction-like activities. This includes use of portable electric power tools with or without an extension cord.

2. GFCI should also be used in areas where, either permanent or portable GFCIs are required by the National Electric Code such as circuits serving outlets in damp, wet, outdoor locations and in any other locations where individuals using an electrical apparatus could become well grounded.

3. Extension cords shall:

   a. be properly rated for the connected equipment,

   b. be factory-assembled with molded caps and plugs,

   c. contain polarized caps and plugs and be equipped with an equipment-grounding conductor,

   d. not be fabricated using electrical boxes or duplex receptacles,

   e. not be used if caps, plugs and outer jacket are damaged,

   f. be used for temporary power only,

   g. not be placed in a manner that could cause damage to the outer jacket or a trip hazard to personnel. Tape may be used to temporarily attach extension cords to surfaces,

   h. be located with at least 7 feet of overhead clearance when placed over aisles and work areas,

   i. not be used inside equipment for providing electrical power to components.

4. Extension cords or devices identified as Multi-Outlet Strips or Temporary Power Taps may not be used as a substitute for fixed wiring.

5. Re-locatable Power Taps may be used in offices, labs and cleanroom areas to provide electrical power to equipment such as personal computers provided the combined load does not exceed the rating of the circuit and the taps are listed and equipped with circuit protection that does not exceed the rating of the power source.

6. Temporary wiring must be de-energized when not in use.

6.13 Temporary Lights

1. Temporary lights must be equipped with guards to prevent accidental contact with the bulb unless the reflector construction is such that the bulb is deeply recessed.

2. Temporary lights must be protected by GFCI circuit.

3. Temporary lights must not be suspended by their electric cords unless cords and lights are designed for this means of suspension.

4. Temporary lights shall be removed at the end of the project or as directed by the FC.

6.14 Hot Work

1. Contractor shall review and understand CNSE EHS-00029 Hot Work Procedure and submit a Work Authorization Permit with Hot Work Permit included.

2. A permit is required for any proposed use of equipment that has an open spark or flame, and any cutting, welding, brazing, grinding and soldering.

3. Permits shall be approved prior to the start of work and in accordance with the requirements set forth in 29 CFR 1910 Subpart Q-Welding, Cutting and Brazing.

4. A fire watch shall be assigned and present when such work is in progress and shall be posted for ½ hour after the work ends.

5. Contractors shall furnish their own fire extinguishers and inspect them periodically.

6. Gas cylinders shall be placed far enough away from welding or cutting operations so that sparks, hot slag, or flames will not reach them; When such a location is impractical, fire resistant shields shall be provided.

7. Welding shields or screens shall be provided and used at all times. Shields or screens shall be of non-asbestos, fireproof material and placed to protect others from visual effects of cutting or welding.

8. Hot Work Operator shall inspect equipment prior to work and insure it is in proper working condition and that controls are in place in accordance to Hot Work Procedure.

9. Hot Work Operator shall evaluate the need for proper PPE for work being performed.

10. A copy of the Hot Work Permit shall be retained and filed by the EHS Department; and a copy shall be posted in a visible location within the hot work area.

11. Regarding acetylene activities within cleanroom areas; validate via checklist during Pre-Task Planning (PTP) that a torch-strike is required, and then implement the following:

- Pre-walk the route to identify any ambient sensors that may potentially be impacted.
- Determine availability of snorkel exhaust. Use is mandatory when available.
- Smoke Eaters required on PM Program and keep spare filters in stock.
- Only strike the torch in an area away from the sensor. If it is not possible to strike away from the sensor, then the strike must be shielded.
- In the rare event that an issue is seen to have no obvious way to avoid, work with Operations to get a window of time to complete the work.

6.15 Heaters and Salamanders

1. Any proposed use of heaters or salamanders shall be approved by and coordinated with the FC.
2. A permit shall be obtained prior to using a heater or salamander.
3. Contractors shall furnish fire extinguishers, which are suitable for the type of work being performed.
4. Heaters and salamanders shall be:
   a. listed by Factory Mutual (FM) or Underwriters Laboratory (UL),
   b. located at least 10 feet from tarpaulins, canvas or similar coverings; these coverings shall be securely fastened to prevent ignition or upset of the heater due to wind action from the covering or other material,
   c. guarded from pedestrian or vehicular traffic to prevent them from being overturned,
   d. refueled outdoors, and
   e. operated only after obtaining a Hot Work Permit from the FC.

6.16 Internal Combustion Engines

1. Any proposed use of gasoline, liquid propane (LP) gas, or any other type of internal combustion engines inside buildings or on roofs shall be approved by and coordinated with the FC.

2. Contractors shall not operate internal combustion engines near building air intakes where fumes could be carried into heating, ventilation and air conditioning (HVAC) systems.

3. If LP gas engines are to be used inside the building, they shall be equipped with oxy-catalyst exhaust purifiers.

4. Contractors shall notify the FC before bringing any gasoline or fuel tanks onto the work site.

5. Fuel shall be stored in approved containers. Storage on a roof is limited to 1 gallon and must have provisions for double containment.

6. Proper emergency equipment shall be available near fuel storage areas.

6.17 Ladders

1. Contractor shall review and understand CNSE EHS-00050 General Guidelines for Handling, Storage and Maintenance of Ladders prior to ladder usage on CNSE site.

2. The design and use of ladders shall comply with all Federal, State and Local legal requirements, including but not limited to, the applicable portions of OSHA 29 CFR 1910.25 through 1910.27 and/or 1926.1053.

3. Ladders shall be constructed of fiberglass material. Aluminum or wood ladders are not permitted and shall not be used on the CNSE site.

4. Ladders shall not have: cracks, loose, missing or bent steps, broken, frayed or worn ropes, missing or damaged safety feet, inoperable extension devices. Defective ladders shall not be used.

5. Ladders shall not be placed in front of doors or door openings unless the door is blocked open, locked or guarded by a responsible person.

6. Two traffic cones to prevent hazards must accompany ladders used in hallways.

7. Ladders shall be secured to keep them from shifting, slipping, being knocked over or blown over by the wind.

8. Straight or extension ladders used to access roofs/platforms shall extend past the support at least 3 feet.

9. Extension ladders shall not be separated because this eliminates the safety feet from one section and can cause damage to pulleys and latches on extension section.

10. A stepladder shall not be used as a straight ladder.

11. The top and the step before the top of an ordinary stepladder shall not be used as steps.

12. Personnel shall always face the ladder and hold onto the ladder when ascending or descending. When material must be handled, it shall be raised or lowered in a safe manner to prevent dropping.

13. Ladders shall be taken down, stowed and secured at the end of each workday.

6.18 Material Unloading

1. The movement of materials, tools and equipment shall be approved by the FC.

2. Contractor supervisors shall monitor the movement of materials in or out of CNSE buildings and/or on or off CNSE property, by Contractor personnel.

3. Contractors may be requested by CNSE Security to produce appropriate authorization when transporting materials on or off the site.

4. Contractors using CNSE docks to load or unload materials shall comply with the following:

   a. vehicle engine shall be turned off.

   b. rear wheels on both sides of the vehicle shall be chocked.

   c. vehicles shall not be left unattended at the dock.

5. Care shall be taken when moving materials to ensure that people are not injured and that walls, ceilings and doors are not damaged. Damage will be back-charged to the Contractor.

6. To maintain emergency egress requirements; carts, tools, materials and equipment shall not be left in aisles or blocking fire doors.

7. Contractors shall use the following preventive measures when moving materials:

   a. piping, conduit, ladders, etc. shall be transported with the forward end of the material raised above head height to reduce the possibility of striking oncoming personnel,

b. piping, conduit, ladders, etc. more than 10 feet long shall be carried by at least two persons, each supporting one end of the material to be transported,

c. caution signs or signal people may be required at corridor intersections to alert personnel, and

d. floor tile load rating shall not be exceeded.

8. Contractor shall remove any boxes, cardboard or crates associated with installation of equipment or supplies that same day to dumpsters. Do not store any boxes or crates in aisles or rooms without FC approval.

6.19 Openings in Floors, Roofs and Walls

1. Openings made in floors, roofs & walls shall be approved by the FC.

2. All floor and roof openings shall comply with Federal, State and Local legal requirements including, but not limited to, OSHA 29 CFR 1910, Subpart D - "Walking-Working Surfaces" and/or OSHA 29 CFR 1926, Subpart M - “Floor and Wall Openings."

3. All floor and roof openings shall be guarded so that no one can fall in or through the opening. The only time the opening may be unprotected is while the opening is being created and guards are being installed.

4. Openings shall be guarded by one of the following:

   a. a cover over the opening that is secured from movement, is designed to withstand its maximum load or 300 lbs, whichever is greater, and does not deflect more than ½ inch when the designed load is applied to the center, or

   b. a standard railing (42-inch high top rail, 21-inch high mid-rail, 4-inch high toe-board), which withstands a 300-pound load applied on the top rail.

5. Every open-sided floor, 6 feet or more above the adjacent floor or ground level, shall be guarded by a standard railing (as defined above) on all open sides; except where there is entrance to a ramp, stairway or fixed ladder. The railing shall be provided with a standard toe-board wherever persons can pass beneath the open sides or there is machinery and/or equipment that can be damaged by material falling from above. When standard railing is not provided, Contractor must provide a personal fall arrest system in compliance with OSHA 29CFR1926.

6. Wall openings that pose a hazard because of their location shall be guarded in the same manner as floor or roof openings.

7. Raised floor tiles and their support stanchions shall not be removed or altered unless approved by the FC.

8. When raised floor tiles are removed, barricades, cones or other alerting techniques shall be utilized to prevent individuals from falling into the opening. Whenever raised floor tiles are removed and the drop is 4 feet or more, the holes, or openings shall be guarded by standard railing, or if this cannot be provided, a personal fall arrest system must be employed.

9. Penetrations through floors, walls, ceilings and roofs for conduit, piping, and ductwork shall be restored/sealed using appropriate construction materials and methods that maintain the designated fire rating. The Contractor that made the penetrations is responsible for the restorations that meet the standards.

10. The roof manufacturer shall authorize Contractors conducting roof work. A copy of that authorization letter shall be submitted to the FC prior to start of work.

6.20 Overhead Work

1. Contractors shall not work above hung ceilings over occupied offices or areas. Area below ceiling shall be vacated prior to start of work.

2. Contractors performing overhead repairs or minor construction activity from ladders or other lifting aids shall use barricades, cones, caution tape or other alerting techniques to warn people of the potential hazard.

3. Contractors performing major overhead construction shall barricade the area and erect construction signs to keep out unauthorized personnel.

4. Contractors shall wear hard hats when they work in areas or perform operations where there is a potential for head injury.

6.21 Roofs and Elevated Work Surfaces

1. Access to the roof of any building owned or leased by CNSE and other elevated work areas shall be approved by and coordinated with the FC.

2. Contractors shall follow the site procedure(s) for roof access. Provide your cell phone number to CNSE Security and have them unlock door to roof.

3. Unless specifically required by the scope of work, Contractors shall not access a roof or elevated work area that is severely damaged or covered with ice and/or snow.

4. Unless specifically required by the scope of work, Contractors shall not access or remain on a roof or elevated work area during periods of inclement weather (e.g., fog, snow, sleet, hail, heavy wind, heavy rain, electrical storms, etc.).

5. When the scope of work requires Contractors to work on a sloped roof or within 10 feet of an unprotected roof edge, platform or other elevated work area, they shall utilize securely anchored ANSI approved fall protection equipment. Contractor shall comply with all Federal, State and Local regulations including, but not limited to, OSHA 29 CFR 1910 and 1926, including 1926.501/502.

6. Contractors shall protect the roof surface from damage by personnel, equipment or materials.

7. Contractors shall hoist material and equipment to and from roofs and elevated work areas in conformance with Federal, State and Local regulations.

8. Contractor shall not overload roof with equipment and/or material. FC shall approve roof loading prior to start of work.

9. Contractor shall remove all equipment, tools, packaging, and debris at end of each day and dispose of in proper dumpsters.

10. All exposed lightning rods below elevated workers or situated within ten feet of work that could expose a worker to an impalement hazard, must be temporarily removed or covered by a suitable protective device before any work commences. The rods must then be uncovered or replaced at the end of each day, or when work stops due to anticipated inclement weather.

6.22 Scaffolding

1. Any proposed use of scaffolding shall be approved by and coordinated with EHS and the FC.

2. The use and construction of scaffolding shall comply with good industry practice and Federal, State and Local legal requirements, including but not limited to, OSHA 29 CFR 1910.28 and/or 1926.451.

3. Assembly/disassembly of scaffolds shall be performed under the direction of a qualified person.

4. Scaffolds and their parts shall be sound and capable of supporting 4 times their maximum intended loads.

5. The footings for scaffolds shall be sound and capable of carrying 4 times the maximum intended load.

6. Unstable objects shall not be used to support scaffolds or planks.

7. Wheeled scaffolds shall have lockable wheels that are locked whenever employees are on the scaffold.

8. A safe means shall be available for access to the work platform.

9. Guardrails, guardrail screens, toe-boards and outriggers shall be used when required.

10. Platforms shall be secured to prevent slippage.

11. Each person on a swinging scaffold shall be equipped with a lifeline and safety harness.

12. Lifelines shall be a minimum of ½-inch nylon rope, or equivalent.

13. Lifelines shall be secured, above the point of operation to a roof anchor or building structural member, in such a way that it will limit a fall to not more than 6 feet.

14. Welding, burning or open flame work shall not be performed on scaffolds that are suspended by fiber or synthetic rope.

6.23 Safety Violations/Disciplinary Actions

1. The primary objective for our employees and those that work on this site is to provide a safe work environment for all. Each individual is responsible to comply with the guides provided here along with OSHA standards as noted. When safety policies and procedures are violated or individuals continue to be involved in accidents or infractions, disciplinary action must be considered. The intent is to impress upon the individual and their supervisor the importance of safety on CNSE site.

2. When a Contractor is observed committing an unsafe act or not following the requirements in the Contractor’s Guide, the individual will be informed by means of a written safety notice. If the action continues there will be further disciplinary action taken in forms of suspension or permanent debarment from working on CNSE site.

3. Examples of written warnings of violations are:
   a. failure to wear PPE (e.g., hard hats, safety glasses, safety shoes, etc.),
   b. ignoring or removing barricades,
   c. using ladders improperly,
   d. grinding, welding, soldering without proper PPE or permit.
4. Repeat violations within thirty days will result in the following penalties:
   a. second violation will result in a three day suspension,
   b. third violation will result in debarment from working on CNSE site.
5. Examples of immediate three day suspension are as follows:
   a. operating Powder Actuated Devices without a permit and certification,
   b. using power tools without proper safety guards in place,
   c. failure to properly cover energized junction boxes, outlet boxes, circuit breaker panels, and other electrical distribution equipment when work is not being performed in or on the equipment and the equipment is energized,
   d. lifting loads with improper rigging,
   e. welding or burning without proper fire watch in place or a fire extinguisher in immediate area,
   f. using cords with grounding plug removed.

7 EMERGENCY SITUATIONS

In the event of fires, accidents, chemical spills, or other emergencies:

1. Evacuate to a safe area then immediately notify Security call 78600 from a CNSE internal phone or (518) 437-8600 from an outside line.
2. Provide the type of the emergency, your name, phone number, and building column, floor or outdoor location.
3. Stay on the line to answer questions and get information about what to do until help arrives.

7.1 Accidents and Injuries

1. The Contractor needs to notify CNSE Security at 78600 from a CNSE internal phone or (518) 437-8600 from outside line for medical or other emergencies. CNSE Security will make notification to emergency response personnel and assist responding agencies to the exact location. CNSE Security will also initiate the ERT response.

2. Notify the FC of any property damage or Contractor/subcontractor injury that occurs while at the CNSE site.

3. Submit the accident investigation report (CNSE EHS-00026-F2) to EHS and the FC within 3 working days after the date of the incident including corrective actions to prevent a reoccurrence.

4. Maintain OSHA 300 Records and have them available for submission to CNSE upon request.

5. The Contractor will notify (or request that Security notify) the EHS department immediately following any on-site, work-related accident/incident resulting in the death or hospitalization of one or more of its employees.

7.2 Bloodborne Pathogens

1. Contractor shall review and follow CNSE EHS-00012 Bloodborne Pathogen Exposure Control Plan.

2. Contractors with exposure to bloodborne pathogens or other potentially infectious material (OPIM) shall comply with OSHA 29CFR 1910.1030.

3. Contractors will follow accepted work practices and use protective equipment as appropriate for job tasks.

4. Contractors will not handle equipment, containers or bags labeled and/or color coded as biohazards unless specifically authorized to.

5. Contractors will report all first aid incidents involving the presence of blood or OPIM to their supervisor and the CNSE FC before the end of the work shift during which the incident occurred. Trained personnel will perform decontamination of the area. Contractors shall ensure timely evaluation and management of all first aid providers who rendered assistance in order to determine whether or not an "exposure incident" occurred as defined by the standard.

6. Contractors will notify the FC and CNSE EHS of any contract employee having or suspected to have active TB. Arrangements are made by CNSE, with assistance from the contract company, for the Public Health

Department (PHD) representative to tour the CNSE work area. The Contractor's company and the PHD shall make arrangements for testing and follow-up of contract employees, which have been determined to be at risk.

7.3 Emergency Alarms

1. If the white fire alarm strobes start to flash and an audible fire alarm sounds or an announcement to evacuate the building is made, evacuate through the nearest exit and report to designated Rally Point.

2. If the Blue TGMS Alarm lights start to flash and an audible alarm sounds, immediately leave the affected area and follow the TGMS Alarm Signs to the appropriate rotunda.

3. Remain at the Rally Point or TGMS safe refuge area until an "All Clear" is sounded over the public address system, or a member of the Emergency Response Team tells you that you may re-enter the building/area.

4. Contractor supervisors shall account for all their employees and let the FC know of their status.

7.4 Emergency Equipment

1. The contractor shall provide emergency and safety equipment required to do the job they are working on, including but not limited to, personal protective equipment like hard hats, safety glasses, gloves, safety shoes, Tyvek coveralls, fire extinguishers for hot work, and air monitoring equipment, fans, and emergency rescue equipment for confined space entry.

2. Obtain approval from the FC and have an approved Fire Protection System Daily Permit (CFM-00005-F1) prior to work on fire alarm systems, and sprinkler systems.

3. Obtain approval from the FC prior to work on hose stations, emergency eyewash/showers, and fire extinguishers.

4. Do not use fire hydrants for a source of water because they are for emergency use only.

7.5 Fire Prevention

1. CNSE fire equipment shall not be used, moved, blocked or otherwise disabled unless approved by and coordinated with the FC.

2. Provide fire suppression equipment and trained personnel to use it when conducting hot work.

3. No combustible material shall be stored outdoors within 10 feet of a building or structure.

8 SPECIAL HAZARDS

8.1 Lead Safety

1. Construction and renovation activities involving the disturbance of lead-containing materials or settled lead dust may be hazardous if appropriate work practices are not followed. Examples of potential lead-containing materials include, but are not limited to, paint and primer coatings, noise and vibration dampers, radiation-shielding materials, and Terne sheet metal.

2. Contractors are responsible for evaluating and controlling their employees' occupational exposure to lead. Contractors shall not remove, handle or otherwise disturb lead or material suspected of containing lead without the approval of and coordination with the FC.

3. Prior to work on painted surfaces, Contractors shall contact the CNSE FC to request sampling and analysis of paint and/or primer coatings for determination of their lead content. When feasible, lead-based paint and primer coatings shall be removed manually with the aid of CNSE approved wetting agents and solvents prior to work on substrate materials. Aggressive removal techniques may only be used when manual removal methods are ineffective. In such instances, the specific work practices and engineering controls to be employed shall be submitted to the FC prior to the start of work. Examples of aggressive removal techniques include, but are not limited to: abrasive blasting, burning, grinding, heat-gun application, mechanical chipping, scraping or sanding, and power washing.

4. Lead bricks and sheeting used for noise reduction, vibration dampening, and radiation shielding may only be removed or handled with prior authorization from the FC.

5. Contractors shall not use lead-containing mortar, paint, or primer on construction or renovation projects. Use of lead-containing solders on water pipes is also prohibited.

6. All work involving the handling of lead-containing materials shall be conducted in accordance with all applicable Federal, State and Local regulatory requirements including, but not limited to, the OSHA standards for lead, OSHA 29 CFR 1910.1025 and 29 CFR 1926.62.

9 POWER VEHICLES

9.1 Motor Vehicles

1. Contractors shall obey New York State DOT and CNSE traffic regulations, as well as, posted speed limits while operating a motor vehicle on CNSE property.

2. CNSE Parking Rules and Regulations are available at the CNSE Security desk located in the NFE rotunda.

3. Contractors shall yield the right-of-way to pedestrians and emergency response vehicles.

4. Contractors shall park their vehicles in designated parking areas only. Contractors shall not park in restricted, reserved, visitors or second-shift parking spaces.

5. Contractor vehicles and equipment shall not block exits, walkways, roads, loading areas, fire hydrants or emergency equipment.

6. Contractors shall not perform maintenance or repairs to vehicles, equipment, engines, transmissions or other fluid-containing systems on the CNSE site unless specifically authorized to do so by the FC.

7. Contractors shall turn vehicle engines off when parked to reduce the probability that engine exhaust will be drawn into building ventilation systems.

8. Contractors and flag persons shall wear orange or red warning garments when exposed to public vehicular traffic. Warning garments worn at night shall be of reflective material.

9.2 Powered Industrial Vehicles

1. Contractor shall review and understand CNSE EHS-00035 SOP for the Use of Powered Industrial Vehicles prior to use of powered industrial vehicles on CNSE site.

2. Any proposed use of powered industrial vehicles (e.g., fork trucks, platform lifts, motorized hand trucks, burden carriers, etc.) shall be approved by and coordinated with EHS and the FC.

3. Powered industrial vehicles and their use shall comply with Federal, State and Local legal requirements including, but not limited to, OSHA 29 CFR 1910.178 - "Powered Industrial Trucks" and 1926.602 – “Material Handling Equipment”

4. Powered industrial vehicles shall be maintained in good working order with no modifications, missing guards, or leaking fluids.

5. If Powered industrial vehicle is equipped with seat belts, they must be worn.

6. Powered industrial vehicle operators shall be trained and qualified to operate the vehicle in accordance with OSHA 29 CFR 1910.178.

7. Contractors shall supply the FC information on the operator's training and the powered industrial vehicle's inspection, preventive maintenance and safeness records.

8. Powered industrial vehicles and any associated attachments or rigging equipment shall be inspected each day prior to use. Defective equipment shall be taken out of service.

9. Contractors shall not use CNSE power vehicles unless appropriate contractual provisions exist between CNSE and the Contractor.

10. Operators of powered industrial vehicles shall carry their operator’s license with them at all times.

11. Contractors using fork trucks and material lifts that are supplied with seat belts shall use the belts when operating the equipment.

9.3 Cranes and Hoists

1. Contractor shall review and understand CNSE EHS-00067 Cranes, Hoist, Lift and Sling Policy prior to use of such on CNSE site.

2. Contractor shall review and follow EHS-00040 SOP for Crane Work Permits and fill out a “CNSE Crane Work Permit”.

3. The construction, inspection, operation and maintenance of hoists and cranes shall comply with Federal, State and Local legal requirements including, but not limited to, the following:

   a. OSHA 29 CFR 1910, Subpart N - "Materials Handling and Storage"

   b. OSHA 29 CFR 1926, Subpart N - "Cranes, Derricks, Hoists, Elevators and Conveyors."

c. OSHA 29 CFR 1926, Subpart CC – “Cranes and Derricks in Construction”

d. Relevant ANSI and ASME standards

4. Cranes and hoisting equipment are powered or manually operated devices used to lift, or to lift and transport suspended loads. Special precautions are necessary to control hazards associated with hoisting operations.

5. Hoisting equipment includes, but is not limited to, hoists, cranes, slings, shackles, grabs, beams, gantries and lifting bars.

6. Any proposed use of cranes and hoisting equipment shall be approved by and coordinated with the FC. In addition, the CNSE EHS department shall be notified before mobile cranes, tower cranes and derricks are used.

7. Contractors shall not use CNSE hoisting equipment nor attach their hoisting equipment to CNSE property unless the attachment point is rated to withstand the load and is specifically authorized by the FC.

8. Hoisting equipment shall be designed, built and rated to withstand the applied load. The equipment shall be prominently marked with the rated load.

9. Daily inspections shall be performed on hoisting equipment before it is used.

10. Defective equipment shall be taken out of service and tagged.

11. Operators shall be trained in the operation and safe use of hoisting equipment.

12. Load hooks shall be swivel-type and self-tracing.

13. Hoisting equipment shall not be used to lift people unless it is designed and approved for that purpose.

14. The area or building section within the swing radius shall be barricaded to prevent people from entering.

15. Personnel shall be kept clear of suspended loads and loads about to be lifted.

16. Hoisting equipment shall be removed from the site or otherwise secured when it is not being operated.

17. Cranes shall have evidence of an annual inspection.

18. Contractor shall review and follow EHS-00040 CNSE Crane Work Permits SOP prior to crane usage.

19. A thorough inspection shall be performed on the crane after it has been placed/erected, but before the lifting of the boom. Each day a written inspection checklist shall be completed by the Contractor and remain on the vehicle during operation.

20. All operators shall be licensed by the State of New York for the type of equipment they are operating, (e.g., crane operator, boom truck operator, crane operator restricted to cherry picker type hydraulic cranes, etc.). This shall include any vehicle with a reach capability of 40' or more, or a lift capacity of 5 tons or greater. The operator of these vehicles must have a current New York State crane license. All certifications and licenses shall be provided to the FC at least two days before the work starts.

21. Cranes shall not be operated in inclement weather (e.g., lightning, high winds, storms, heavy rains, poor visibility, etc.) and:

    a. the Contractor shall supply trained signal people, where necessary,

    b. cranes shall not be operated within 50 feet of overhead electrical power lines without approval of the FC,

    c. the requirements of OSHA 29 CFR 1910.333(c)(3) and/or 1926.416 shall be strictly followed when working near overhead electrical power lines.

22. All people in the hazard area shall wear ANSI Z89.1 approved hard hats and ANSI Z41.1 approved safety shoes while the crane is in operation, during rigging and during picking.

9.4 Mobile Lifts and Work Platforms

1. Mobile work platforms and their use shall comply with Federal, State and Local legal requirements including, but not limited to, OSHA 29 CFR 1926.453, 1926.556 and ANSI A92.3/A92.6.

2. Any proposed use of mobile work platforms, (e.g., aerial lifts, elevating aerial platforms, elevating work platforms, rolling mobile scaffolds, vertical lifts, etc.) shall be approved by and coordinated with the FC.

3. Mobile work platforms shall:

a. have emergency stop devices located at both the upper and lower control stations that will deactivate all powered functions,

b. have a self-propelled platform equipped with passive brakes which shall hold the unit on any slope it is capable of climbing,

c. have a platform with a method to prevent free descent in case of hydraulic, pneumatic, electrical or electromechanical failure,

d. have a power-elevated platform with a clearly identified means for emergency lowering that is readily accessible from ground level,

e. have hydraulic or pneumatic actuated outriggers or stabilizers that shall not retract in the event of a system failure,

f. have a platform with a 42-inch high top railing, an intermediate railing, a toe-board and a chain or self-closing gate at the platform entrance,

g. have a slip-resistant platform deck surface,

h. have a clearly indicated platform load capacity.

i. not be moved in elevated position if the ground/floor surface has holes or irregular surfaces which could cause the platform to become unstable or tip over.

4. Contractors shall comply with the following when using mobile work platforms:

a. only trained and authorized personnel shall be permitted to operate the platform,

b. no more than two persons are allowed on the platform,

c. the platform entrance chain or self-closing gate shall be closed before the platform is raised, lowered, moved or used,

d. employees shall always stand firmly on the floor of the platform and never sit, stand or climb on the rails or use planks, ladders or other devices on the platform,

e. employees shall wear fall protection when working from platforms including those that have articulating arms (e.g., bucket trucks and aerial lifts),

f. safety cones shall be placed around the platform to alert personnel of potential hazards,

g. the platform shall not be raised to a height that exceeds four times the width of the base unless outriggers are extended,

h. prior to use each day, the platform shall be inspected for defects and properly operating controls.

5. The platform deck shall be kept clear of tripping hazards and slippery substances.

10 PERSONAL PROTECTIVE EQUIPMENT

Contractors shall comply with the requirements of OSHA and ANSI standards which apply to employee training, performance of hazard assessments, selection, use, care and disposal of protective equipment. Contractors are responsible for assessing the hazards and determining the necessary protective equipment. When there is doubt about the safety measures to be observed, Contractors shall consult with their Contractor supervisor. Contractor management is responsible for providing and ensuring that protective equipment is available, properly used and properly maintained. Time lost while obtaining the necessary protective equipment will be at the Contractor's expense. Contractors shall consult the MSDS for additional protective equipment requirements when working with or around hazardous materials. Contractors shall comply with protective equipment requirements pertaining to the CNSE equipment and areas involved in the scope of work. Protective equipment shall be kept in good condition and replaced immediately if damaged.

10.1 Eye and Face Protection

With regards to eye and face protection, Contractors shall:

1. Comply with OSHA 29 CFR 1910.133 and 1926.102.

2. Wear eye and face protection that meets the performance requirements of ANSI Z87.1 and is labeled as such.

3. Wear eye and face protection when machines or operations present potential eye or face injury.

4. Wear safety glasses where there is the potential for flying particles. Safety glasses must have side protection.

5. Use goggles and a face shield together when there is the possibility of a chemical splash to the face and eyes.

6. Use the proper lens shade when welding, cutting, brazing or conducting other hot work operations.

7. Use the proper lens shade when working around exposed laser beams with the optical density (OD) adequate for the laser energy involved.

8. Wear safety glasses on all renovation/construction sites and where noted by signage.

10.2 Fall Protection

With regards to fall protection, Contractors shall:

1. Review and understand CNSE EHS-00041 Policy for Fall Protection prior to conducting work at CNSE site.

2. Comply with OSHA 29 CFR 1926, subpart M - Fall Protection, and ANSI A10.14.

3. Use fall protection equipment when working within 10 feet of any structure or opening where workers are exposed to a fall greater than 6 feet, except where standard 42-inch guardrails are provided on the exposed sides.

4. Use anchorage, connectors, body harness, lanyard, deceleration device, lifeline, or suitable combinations of these.

5. Secure lifelines and lanyards to stable, approved attachment points.

6. Not secure lifelines or lanyards to sprinkler systems or utility piping.

7. Not use a body belt for fall arrest.

10.3 Foot Protection

With regards to foot protection, Contractors shall:

1. Wear safety shoes that meet the requirements of ANSI Z41.1 when the potential for foot injury exists.

2. Wear safety shoes at all construction/rearrangement sites.

10.4 Head Protection

With regards to head protection, Contractors shall:

1. Wear hard hats that meet the requirements of ANSI Z89.1 and ANSI Z89.2.

2. Wear hard hats in areas where there is a possible danger of head injuries from bump, impact, flying or falling objects, electrical shock or burns and where noted by signage.

3. Wear hard hats at all construction/rearrangement sites.

10.5 Hearing Protection

With regards to hearing protection, Contractors shall:

1. Wear appropriate ear protection in high noise level areas (e.g., generator rooms, fan rooms, boiler rooms, etc.) to reduce noise exposure levels as required by OSHA 29 CFR 1910.95 and 1926.52.

2. Notify the FC before performing tasks that create higher than normal noise levels.

10.6 Respiratory Protection

With regards to respiratory protection, Contractors shall:

1. Review and understand CNSE EHS-00015 CNSE Respiratory Protection Program prior to conducting work that requires the use of respiratory protection at CNSE site.

2. Use respirators that comply with OSHA 29 CFR 1910.134.

3. Consider alternatives such as substituting less hazardous materials and the use of temporary ventilation, before requiring respiratory protection.

4. Inform the FC if their work requires the use of respiratory protection. The FC will consult with EHS to determine whether their personnel in the area could be exposed to hazardous materials.

11 RADIATION SOURCES AND EQUIPMENT

11.1 Lasers

1. Contractor shall review and understand CNSE EHS-00048 Policy for Laser Safety prior to using mobile lasers or laser products at CNSE site.

2. Lasers are capable of producing injuries to the eye and skin.

3. Laser equipment shall be operated in compliance with ANSI Z136.1 and NY State Industrial Code Rule 50.

4. Lasers shall not be brought on site without prior approval from the FC and Laser Safety Officer (LSO).

5. Laser products shall comply with applicable Federal, State and Local regulations.

6. Lasers shall be certified with the Food and Drug Administration-Center for Devices and Radiological Health.

7. Lasers shall not be used overnight without prior approval from the FC and LSO.

8. The following information shall be submitted to the FC prior to using mobile lasers or laser products:

   a. a copy of a valid certificate of competence issued by the State of New York Department of Labor (NYSDOL) for each employee operating mobile laser equipment. The category of certification must be appropriate for the intensity of the laser used. (Refer to Industrial Code Rule 50 for information on NYSDOL certification requirements.),

   b. a copy of the Contractor's procedures for safe operation of laser equipment, and

   c. the hazard class, wavelength and output characteristics of each laser.

9. During laser operation, access shall be restricted to authorized personnel, the area shielded and protective equipment used.

10. An appropriate warning sign shall be posted at the entrances to the work area.

11.2 Radiation Equipment

1. Contractor shall review and understand CNSE EHS-00066 Policy for Radiation Safety Program prior to working with radiation sources or equipment at CNSE site.

2. Radiation generating equipment includes any source or equipment that produces ionizing or non-ionizing radiation such as x-ray equipment, radioactive materials, radio frequency (RF) sources, ultraviolet (UV) sources, infrared (IR) sources, and magnetic field sources.

3. DO NOT bring any radioactive or radiation-producing materials onto the site without prior approval from the FC, and the FC must first obtain permission from the EHS Radiation Safety Officer (RSO) at least one (1) week prior to the material’s arrival on site.

4. Radiation sources and equipment shall not be used without the approval of the FC and RSO.

5. Contractors shall follow all Federal, State and Local legal requirements.

6. Contractors shall obtain any licenses or permits necessary to operate the radiation sources or equipment. A copy of the license and the Contractor's safe operating procedures shall be presented to the FC and RSO at least 1 week before work starts.

7. Contractors shall provide radiation safety monitoring equipment as required by law. This monitoring equipment shall have been calibrated within the last year. Proof of calibration and necessary training of Contractor's employees must be submitted to the RSO at least one (1) week prior to work commencing.

8. Contractors are responsible for erecting and maintaining the required warning signs and isolation barriers.

9. Radiation sources shall not be left unattended during use.

10. If work involves maintenance, modification or removal of shielding on a radiation producing device located at CNSE, radiation surveys must be performed after the work is complete. A copy of these surveys must be forwarded to the RSO.

11.3 Radiographic Testing

1. Contractors shall notify the FC and Radiation Safety Officer (RSO) at least 1 week before any planned radiographic testing.

2. The FC will notify the CNSE EHS Radiation Safety Officer (RSO) at least 1 week prior to scheduling any radiographic testing. No radiographic testing will occur without the agreement of the FC and RSO.

3. Contractors shall:

   a. have a current license issued by the state of New York or the Nuclear Regulatory Commission,

   b. meet all requirements of New York State Industrial Code Rule 38,

   c. have all ionizing radiation sources used for testing approved by the Radiation Safety Officer (RSO),

   d. provide copies of their operational and source emergency procedures, source decay curves and Isodose line charts,

   e. have appropriate calibrated radiation monitoring equipment such as a Geiger counter/ion chamber available during testing,

f. erect appropriate warning signs and isolation barriers at a distance from the radiographic testing source where the exposure rate will not exceed 2 milliRoentgens per hour, and

g. not leave radiation sources unattended or overnight on CNSE property.

12 WASTE DISPOSAL

12.1 Waste Handling

With regards to waste handling, Contractors shall:

1. Reduce the amount of waste that is generated, re-use materials with the concurrence of the FC, and segregate waste materials for recycling.

2. Properly transport, store, handle and contain waste to prevent spills, leakage, discharge or release to the environment.

3. Not discharge or dispose of waste into a storm, sewer, industrial or sanitary drain, sink, restroom, trench, trash, dumpster, ditch, stream or body of water, etc. without the specific approval from the FC.

4. Dispose of waste materials according to directions by the FC and the documentation the FC provides (such as contractor chemical authorizations).

12.2 Chemical Waste

1. Contractors shall review and follow CNSE EHS-00009 Specifications for Hazardous Waste Management.

2. Chemical waste includes, but is not limited to: acids /bases, asbestos or asbestos-containing materials, batteries, caulk, caustics, cement/glue or sealant, chemicals, cleaning products, contaminated pipes/ exhaust hoods/ducts/tanks, floor tile, insecticide, laboratory equipment, fluorescent light, ballasts/lamps, oils and fuels, paint & coatings, refrigerants, smoke detectors, and solvents.

3. Contractors shall inform the FC of any chemical waste generated as a result of the performance of their work. Waste includes empty containers depleted at the work site.

4. The Contractor shall remove all hazardous material that they brought on CNSE site and they shall label and dispose of the waste in accordance with all Federal, State, Local and CNSE requirements.

5. Hazardous waste that is generated because of the work that is performed on CNSE site shall not be removed from the site by Contractors.

6. It is the responsibility of the hazardous gas and chemical handling firm (contracted by CNSE) to collect the hazardous waste generated at the point of generation (e.g., labs, cleanrooms, equipment rooms, etc.) and transport them to the appropriate permitted hazardous waste storage locations.

12.3 Solid and Recyclable Waste

Solid waste includes, but is not limited to the following materials (when not contaminated with chemical waste): bottles and cans, cardboard, construction debris, metals, pallets, paper, scrap furniture, and wire.

Contractors shall review and follow CNSE EHS-00009 Specifications for Hazardous Waste Management.