

CONTRACTOR SAFETY ADVISORY

A guide for contractors that details some, but not all , Campus Safety Policies and Procedures pertinent to contractor operations

December 2019 Revision 3

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INTRODUCTION

The health and safety of our students, employees, suppliers, visitors and contractors are valued above all else. Our goal at the University of Delaware is that No One entrusted in our care gets hurt. This can only be achieved through exposure recognition and reduction, being disciplined, following all procedures, and a personnel dedication to work safely. People are our greatest asset, and it's up to each one of us to make a difference. I would like to thank each of you for your commitment to the safety and health of all personnel at the University of Delaware and making every day a safe day. This Advisory contains an overview of selected health and safety good practices and regulatory requirements that may be applicable to Contractor's work at The University of Delaware. It should be considered as an introduction and not a substitute for a thorough understanding of the subjects. Furthermore, it establishes the minimum mandatory requirements for the topics covered and provides guidance on University operations and procedures This Advisory does not relieve the Contractor of its obligation and responsibility to (1) control the manner and means by which it and its employees, subcontractors and agents perform work or services at The University of Delaware, and (2) independently ascertain what health and safety practices are appropriate and necessary for the performance of such work or services. Contractors are expected to be familiar with and follow appropriate health and safety practices, including those required by the Federal Occupational Safety and Health Administration (OSHA) regulations, as well as any applicable state or local codes and University of Delaware policies and procedures. (Additional information about OSHA's requirements can be found at their web site: www.osha.gov).

Peter Krawchyk

Vice President of Facilities and Real Estate Services

December 2019

General Standard Rules While Working On University of Delaware Campus:

- 1. Contractors must adhere to all University policies and federal and state regulations regarding behavior towards employees and the University community at large. For instance, sexual harassment is unlawful and is prohibited.
- 2. Normal working hours shall be 7:00am to 3:30pm Monday through Friday. Work creating noise near or in Residence Halls shall start after 8:30am. If needed, U of D will stipulate different work hours prior to starting a project.
- 3. Contractors, their employees and subcontractors are required to obtain parking permits if they will be using University parking lots.
- 4. All accidents (injuries/illnesses) and near misses, whether injurious or not, and hazardous conditions shall be reported to the UD Project Manager immediately.
- 5. Prior to commencing any project, Contractors shall familiarize themselves with the location of fire extinguishers, eye-wash stations, safety cabinets, safety blankets, safety showers, emergency exits, emergency phones, etc. in case an emergency arises during construction. Emergency exits and corridors shall not be blocked or obstructed. If work requires that exits/corridors be blocked, a review by Environmental Health & Safety shall be conducted prior to work commencing.
- 6. Use signs, signals, and barriers to convey the areas of construction where specific safety precautions and requirements are necessary. This shall be in conformance to OSHA Standards 29 CFR- 1926–Subpart G-Signs, Signals, and Barricades. A University setting can be unique as a construction site because students can be active at unconventional times. Additional steps to barricade and limit or restrict access may be necessary.
- 7. Contractors shall submit Safety Data Sheets (SDS) and outlines of procedures to be employed in using these materials prior to commencing any work. A copy of all SDS sheets and Contractor employees' right to know sign-off sheets shall be maintained at the construction site.
- 8. STAKE-OUTS: The Contractor must notify USP (Miss Utility) at least two days and no more than 10 days prior to proposed excavation. Accurately identify areas and provide information including data as listed in the University's "Facilities Stakeout Procedure". Follow the aforementioned Procedure for normal and emergency stakeouts.
- 9. SMOKING: Smoking and the use of all tobacco products and tobacco related products, including E-cigarettes, is prohibited on all property that is owned, operated, leased, occupied, or controlled by the University.

10. IMPORTANT NUMBERS:

Emergencies (from UD Phone)	9-911
Emergencies (from Non UD Phone)	911
Emergencies (call direct from Blue Light Phone)	
Campus Police	302-831-2222
Building Operations and Maintenance Center Dispatch	302-831-1141
Environmental Health & Safety	302-831-8475
Planning & Project Delivery	302-831-1744
Facilities Management	302-831-4918
USPCD (Miss Utility)	302-282-8555

- 11. PERMITS/AUTHORIZATIONS: Proper authorizations and/or current permits are required before you may begin work. Permits shall be posted at the worksite when required. Permits and authorizations commonly required for work on a site listed below (others may be needed).
 - 1. Facilities Stake Out procedure (Procedure)
 - 2. Confined space entry permit (Permit)
 - 3. Hot work permit (Permit/Tag)
 - 4. Scaffold tags (Tag)
 - 5. Lock out/Tag out (Process/Permit)
 - 6. Trenching (Form)
- 12. Shirts and long pants must be worn at all times while on the facility. Other attire must be neat, and appropriate for the type of work being performed Shoes: Steel toe, closed toe, etc.
- 13. Radios for providing music or other entertainment are not permitted on construction projects.

Pre-Task Plans (PTP)

Contractors are required to submit pre-task plans (work plans, job hazard analysis) for all work at the University. This plan's purpose is to help ensure that all hazards associated with the work are detailed, protective/preventive measures are implemented and both are communicated. See Appendix A for the Pre-Task Plan forms. Other forms may be utilized as long as they provide the same information. For larger projects, sub-contractors are required to submit these plans to the general contractor, which are subject to audit by UD personnel.

General Duty Clause

Where OSHA has not promulgated specific standards to address a given situation, it may rely upon a general duty clause in the OSH Act for the issuance of citations or fines. OSHA interprets this general duty clause (29 U.S.C.654(a)) to give it authority to, in appropriate instances, cite a contractor for hazards to which employees of other contractors are exposed. Selected specific OSHA regulations, which may be applicable to a Contractor's work on a University project are referenced below. (Please note that this is a representative, not an exhaustive list. In all instances, it is the Contractor's obligation to identify the OSHA standards or regulations that are applicable, and to be guided accordingly.)

Personal Protective Equipment

Personal protective equipment (PPE) is used to increase individual safety while performing potentially hazardous tasks, and may include safety glasses, hard hats, gloves, respirators, or any equipment or clothing used to protect against injury or illness. Contractors shall ensure that the proper types of PPE are available for and used by their employees. OSHA's requirements are found in 29 CFR 1926

Subpart-E- Personal Protective Equipment.

Barricades and Fencing

Barricades act as warning devices, alerting others of the hazards created by construction activities, and shall be used to control traffic, both vehicular and pedestrian, safely through or around the work site.

Contractors should use barricades as required in 29 CFR 1926 Subpart G-Signs, Signals, and Barricades, or wherever necessary for the physical protection of people or property.

Temporary cyclone fencing, plastic safety fencing and portable manhole barricades are examples of acceptable barricading.

Yellow caution tape and/or cones are not considered acceptable barricades, and shall be used only until barricades that are more suitable can be erected.

Signage and illumination should be used where appropriate.

Excavations (Including Trenches)

Before excavation work begins, the Contractor shall be familiar with and follow the regulations found in 29 CFR 1926 Subpart P –Excavations, which includes the requirement to have a designated competent person overseeing the excavation. An excavation checklist, which is available at <u>http://www1.udel.edu/ehs/generalhs/downloads/Excavation%20checklist.pdf</u> must be completed

Scaffolding

In its simplest form, a scaffold is any temporary elevated or suspended work surface used to support workers and/or materials. There are many types of scaffolds, both supported and suspended. Contractors who erect or use scaffolding shall be familiar with and follow the requirements of 29 CFR 1926 Subpart L- Scaffolds.

Scaffolding requires a daily tag of inspection completed by a competent person. The tag is to be color-coded green for use permitted without personal fall arrest system or yellow for scaffolds where a personal fall arrest system is necessary. Red means scaffold is not safe to use.

Fall Protection

When work is performed on elevated surfaces that are six feet or more above the surrounding area, protection against falls shall be implemented. Fall arresting systems, which include lifelines, body harnesses, and other associated equipment, are often used when fall hazards cannot be controlled by railings, floors, nets, and other means. These systems are designed to stop a free fall of up to six feet while limiting the forces imposed on the wearer. Contractors shall be familiar with and follow the requirements 29 CFR 1926 Subpart M -Fall Protection.

A variety of systems are available to provide fall protection. Contractors shall analyze the work site, the potential hazards and the magnitude of possible injury to workers in assessing what fall protection systems shall be used.

A Fall Protection Plan shall be written and reviewed with contractor employees and the Project Manager for leading edge work.

Hot Work (See Specific University Policies and Procedures

http://www1.udel.edu/ehs/generalhs/downloads/Hot_Work_Permit_Program%20.pdf) Cutting, brazing, grinding, soldering and welding operations (referred to as hot work) are commonly associated with construction activities. Hot work equipment, which may produce high voltages or utilize compressed gases, requires special awareness and training on the part of the worker to be used safely. Contractors shall control the hazards associated with hot work through the implementation of

effective programs presented under 29 CFR 1926 Subpart-J Welding and Cutting.

Hot Work Permits

Hot work permits serve as a checklist for those involved with hot work and those performing fire watch duties. The person responsible for issuing permits shall be qualified to examine the work site and ensure that appropriate protective steps, such as those listed in this section, have been taken. Whenever possible, please submit requests for hot work permits one week in advance of work. The FM Global Hot Work Permit is utilized at the University. See Appendix B.

Fire Watch

A person other than the person performing the hot work shall perform fire watch duties and remain at the work site for at least 1 hour per state code after hot work operations have ended. Also, the area may be required to be monitored up to 3 hours after the hot work has ended. Additionally, the following steps should be taken:

A fire extinguisher rated at not less than 2-A:10-B:C shall be attached to all portable cutting and welding carts.

If a building or area is equipped with a sprinkler system, then that system shall be operational when hot work is performed

A hot work permit is required for all operations involving open-flame or work producing heat and/or sparks.

Confined Spaces (See Specific University Policies and Procedures)

A confined space is defined as any space that is large enough to enter and perform work, has a limited means of entry or egress (exit), and is not designed for continuous employee occupancy. Examples of confined spaces include but are not limited to pits, tanks, certain tunnels, manholes and underground vaults.

The University of Delaware's procedures for Confined Space Entry follows OSHA's General Industry regulations. All contractors must follow procedures equal to or greater than the UD procedures.

For electronic Confined Space Entry Permit System refer to Website: <u>http://web.facilities.udel.edu/ConfinedSpace/EntryForm.aspx</u> This permit must be filled out and all hazard control measures must be in place before entries are made.

Contractors shall be familiar with relevant portions of <u>29 CFR 1926 Subpart C – General Safety</u> and <u>Health Provisions</u>, and use appropriate entry procedures when working in confined spaces.

When a confined space entry includes hot work (welding or cutting), the additional procedures from <u>29 CFR 1926Subpart J-Welding and Cutting</u> shall be followed.

The University of Delaware's Permitting Process shall be utilized while on University property.

Cover and secure all openings to confined spaces if they will be left unattended. **Cranes**

The use of cranes to lift heavy equipment, building materials, protective systems, erect steel, etc. is inherently dangerous. All parties who are responsible for the use of cranes while working at the University of Delaware are expected to comply with Subpart CC of 29 CFR 1926 1400 (et al.) as the standard pertains to their work.

The responsibility for compliance with the standard in its entirety falls upon the individual crane contractor in as much as it is dictated by the standard.

The following sections provide excerpts and highlights of the crane standard as well as general guidelines and procedures for crane use and operation on the UD campus.

The procedures in these sections ensure that contractor employees understand crane and derrick safety training, operation, and maintenance practices. These requirements are also designed to ensure that procedures are in place to protect the health and safety of all contractor and UD employees, students and visitors.

<u>Lift Plans</u> - A lift plan must be provided to the University of Delaware EHS Department through Project Manager for review and approval, prior to performing any lifting operations. The lift plan must include:

- The type, size, model, lifting capacity, certification date and serial number of the crane to be used.
- A list of items to be lifted/moved, including a description of each item's weight, dimensions, center of gravity, and presence of hazardous toxic materials.
- The plan may include sketches showing lifting points, methods of attachment, sling angles, load vectors, boom and swing angles, crane orientations, related capacities, and other factors affecting the equipment and lifting operation.
- The name of the Operator, Rigger and Competent Person and copy of license/certification.
- Applicable rigging to be used as well as precautions and safety measures.
- A pre-lift meeting to review the plan, must be held before the actual lift, and be attended by the operator rigger(s), competent person and others as required.

<u>Responsible Parties</u> - The crane contractor must provide the following personnel in order to operate a crane safely on University of Delaware property. These are dictated by the OSHA standard and dependent on the type of crane being utilized and the work being done:

- Assembly / Disassembly Director (A/D Director)
- Competent Person
- Qualified Person
- Qualified Rigger
- Qualified Signal Person

A Critical Lift Plan and Critical Lift Checklist must be completed by the subcontractor and submitted to the University of Delaware Project Manager when any of the following conditions exist:

- The load exceeds 75 % of the crane's load chart
- Whenever the load and/or travel radius is expected to travel over any portion of an occupied building
- The load exceeds 100 tons
- If the lift involves multiple cranes, a system must be instituted by the controlling entity to coordinate operations.
- The crane is being used to lift personnel
- University of Delaware has determined that the plan and checklist are necessary

<u>Structural Analysis – If the lifted load will be placed on a structure (i.e. roof), than a structural analysis</u> must be performed to determine if the structure is capable of supporting the load.

<u>Swing Radius/Work Area -</u> Each employee who works in or near the crane, is required to be trained in the hazards associated with and how to recognize "struck by and pinch / crush" hazard areas. Control lines, warning lines, guardrails, or barriers must be erected and maintained in order to mark the boundary of the hazard area and keep untrained individuals outside the area. Once in the hazard area, an employee is required to notify the operator of their presence any time that they have gone to a location inside the hazard area that may no longer be within the view of the operator. The operator shall not rotate the equipment until the employee has indicated that they are in a safe position.

No employees are allowed within the fall zone (whether the crane is moving or not) except for employees who meet the following conditions:

- They are engaged in hooking, unhooking, guiding, or receiving a load.
- They are engaged in the initial attachment of the load to a component or structure.
- They are operating a concrete hopper or bucket.

Lockout/Tagout (See Facilities Energy Control Procedure -

http://web.facilities.udel.edu/docs/Safety/LockOutTagOut.pdf)

Lockout/Tagout procedures are designed to prevent accidental startup of machines or equipment, and to prevent the release of stored energy. Through the application of locks and/or tags as direct controls, equipment is isolated from energy sources and injuries to workers are prevented. When work affects, or is done in association with, University personnel, Contractors shall submit their lockout/tagout procedures to the University's Project Manager.

Work on cord and plug-connected equipment is not covered by this program if unplugging the equipment controls all energy and the plug remains under the continuous control of the employee performing the service work.

Contractors shall, at a minimum, adhere to the following procedures found in <u>29 CFR 1926 Subpart</u> <u>K- Electrical</u>:

Controls

Controls that are to be deactivated during the course of work on equipment or circuits shall be locked and tagged.

Equipment and circuits

Equipment or circuits that are de-energized shall be rendered inoperative and shall have locks and tags attached at all points where the equipment or circuits could be re-energized.

Tags

Tags shall be placed to identify plainly the equipment or circuits being worked on. Always test the system by trying to turn on equipment, etc.

Electrical Safety

All contractors and their personnel must be familiar with 29 CFR Subpart K, General Electrical. This standard covers four major divisions: installation safety requirements, safety related work practices, safety-related maintenance and environmental conditions and safety requirements for special equipment. Some specific examples include: daily inspection of extension cords and GFCI requirements.

All contractors should be aware of OSHA's requirements for <u>arc flash protection</u>. This covers all skilled trades at risk. (Arc flash studies are being performed to determine arc hazard category and needed personal protective equipment.) Whenever there is a doubt, consult with UD Manager of electrical maintenance.

Line Cutting

The intentional cutting of a line – electric, steam, gas, nitrogen, etc. – can be just as dangerous as the unintentional rupture of a utility line if the wrong line is cut. If a utility line or other previous chemical-containing line needs to be cut, adequate identification of the line, assurance that it is not in service, and approval to cut is needed. The University has a comprehensive line cutting procedure to address this risk. Please see your University contact to obtain a copy of this procedure.

Powered Industrial Trucks

All Contractors should follow the OSHA 29 CFR 1910.178 regulations requiring training, certification and any special licenses that may be required to operate equipment on site. A copy of such certifications and or licenses should be given to the University contact person before work begins.

- No one under the age of 18 may operate any Powered Industrial Truck in accordance with (29CFR 570.58).
- Ensure that barriers are set up at ground level when working at heights to avoid foot traffic below.
- All Powered Industrial Trucks shall be safely secured at the end of the work shift by lowering the forks/baskets to the ground and erect fencing, caution tape and or safety cones around the truck to secure it.
- Any power operating industrial truck not in safe operating condition shall be removed from service. All repairs shall be made by authorized personnel.
- At no time shall any Contractor hitch a ride on or use a forklift to work on a project at heights where a bucket lift or man lift would be suitable for the task.
- Safety harnesses and lanyards must be in good condition, used when working at heights and secured to an appropriate anchor point. Construction safety regulations under 29-CFR1926.602 mirrors that of 29-CFR 1910.178 of the OSHA regulations that covers the training, operation and maintenance of all Powered Industrial Trucks.

LASER Research Laboratories

The University of Delaware operates over 100 lasers that can permanently injure the eye even with momentary viewing. Some of these lasers are enclosed but many cannot be enclosed for various reasons.

In labs where there are unenclosed laser beams, operators take extra care in controlling the beams to prevent injury to those present in the room, however, there is always a risk that an operator has made a mistake and there is a hazardous beam, or reflection of the beam, present in the lab.



For this reason, rooms with unenclosed high-powered

laser beams are outfitted with an illuminated warning sign at the lab entrance that will be turned ON when the laser experiment is in progress. The purpose of the sign is to warn all visitors to the lab to NOT ENTER without a lab escort.

Safety Rules for Entering LASER labs

- If you need to work in a LASER lab, it is best if you contact lab staff in advance and schedule your visit. The lab can then plan to make the lab safe for you. This potentially saves you from a wasted trip and is less disruptive for the lab.
- Before entering any laboratory at UD, especially LASER labs, look for and read all warning signs at the entrance. Obey the signs for your protection!
- If the LASER lab has an illuminated warning sign and the sign is turned ON, <u>do not enter the lab</u>. You may knock on the door to see if a laser operator is present. If it is safe for you to enter, an operator will come to the door and escort you inside.
- If you enter a LASER lab and operators are wearing tinted laser safety glasses, immediately leave the lab - even if you are not asked to leave by the operators.
- If you have questions about whether it is safe to enter a lab of any type at UD, you may contact UD Environmental Health and Safety at 302-831-8475.







Laboratories that Use Radioactive Materials

Radioactive tracers are very useful in research labs because they can be added to an experiment and then easily tracked with radiation detectors. Not a lot of tracer is needed for this type of work so the amount of radioactive material in UD labs is very small and presents very little risk even to the every-day lab worker.

Radioactive tracers are often used in liquid form, however, so there is a risk they can be spilled and contaminate work surfaces and lab tools. For this reason, all work surfaces and tools used for radioactive material work are labeled with radiation warning signs or tape. The primary message for non-lab



workers entering a radiation lab is to NOT TOUCH anything that is labeled.

Safety Rules for Entering Labs that Use Radioactive Materials

- Look on the warning sign at the entrance to the lab to see if the lab is approved for radioactive material work. If it is, you will see the radiation symbol and the words "Radioactive Material". See photo below.
- Once inside the room, explain to lab staff what you need to do in the room and asked them any questions you may have regarding their radioactive material work. UD EHS may also be contacted if you have questions- the contact phone number for EHS is on the sign at the lab entrance.
- Look around the lab and find all the workbenches, fume hoods, refrigerators, waste containers, work tools and other items that are marked with a radioactive material warning sign or tape. See pictures on this fact sheet for examples. Do not touch anything that is labeled or put anything on a labeled work surface. If you need a labeled item moved to perform your task, ask a member of the lab staff to move it for you.
- If your task involves working with a radioactive material labeled item, for example, repairing a labeled refrigerator, unclogging a labeled sink, or changing the light inside a labeled fume hood, UD EHS must first be contacted to determine whether or not a survey for radioactive contamination must first be conducted. If a survey is needed, EHS will conduct the survey and then inform you that you may proceed with your task. The contact phone number for UD EHS is on the sign at the entrance to the room. If you are unable to reach EHS, do not proceed with your task.
- If you are concerned that you, or your equipment, may have become contaminated with radioactive material, contact UD EHS. UD EHS can scan the items of concern easily and quickly with radiation detectors. If contamination is found, it is usually removed easily with standard soaps and cleaning solutions.



Exposure Monitoring

Potential exposures include, but are not limited to, nuisance dust, chemical vapors, hazardous materials (such as lead) and noise. The Contractor shall take all necessary precautions to control or contain fugitive emissions from the job site.

Employee exposures to airborne hazardous substances must be maintained below OSHA permissible exposure limit (PEL), found in 29 CFR 1910.1000 Table Z, or American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV) for any chemical.

Where engineering controls will not adequately control exposures or are not feasible, and the potential exists to create air concentrations in the work area above the PEL or TLV, work area exposure conditions shall be monitored. Monitoring should occur, at a minimum during the start of work and whenever there is a change in procedure, process, or chemical or material used.

Asbestos

Asbestos was incorporated in a number of widely used products, many of which were used in building construction from the late 1800's through the mid-1980's, when most University buildings were constructed. The most common use of asbestos in the University buildings was in floor tile, mastic, caulking, roofing, thermal systems insulation (TSI) such as pipe insulation and tank insulation, plaster, and structural steel fireproofing. Joint Compound and spackle can also contain asbestos here at the University. Per the OSHA Asbestos Standard (29 CFR 1926.1101) building materials installed prior to 1980 shall be presumed to contain asbestos unless historical information or testing indicates otherwise.

- Contractors employed by the University to perform building or facilities-related maintenance, repair or renovation shall be provided the location of suspect and known asbestos-containing materials (ACM) in the work area(s) to which they are assigned.
- Contractors shall, under no circumstances, damage or disturb known or suspect ACM (unless they are a licensed Asbestos Abatement Contractor and have been specifically employed to perform asbestos repair or removal). If in the course of the work, suspected asbestos materials are discovered, the contractor shall stop work that might disturb the material immediately and notify the Project Manager.
- It is the responsibility of the Contractor to provide its employees with an asbestos awareness program, which shall include, but not be limited to the information contained in this section and appropriate federal and Delaware regulations.

Lead

Many buildings built or renovated before 1978 have lead-based paint applied to some interior or exterior surfaces. Paint containing 0.5 percent or more lead by weight or 1 mg/cm2 or more lead by x-ray fluorescence is considered to be lead paint.

- Contractors employed by the University will be provided the location of known leadcontaining building materials in the work area(s) to which they are assigned. If there are any questions about lead content, contact the Environmental Health and Safety Department at (302) 831-8475.
- Contractors that disturb lead paint during the course of work shall ensure all work is in compliance with the 29 CFR 1926.62, Lead, including controlling exposures below the

permissible exposure limit and providing biological monitoring for employees, as needed.

- Contractors that disturb lead-based paint during the course of work shall take all necessary precautions to protect University employees, students and visitors from exposure to lead dust or contamination. Such measures may include but are not limited to, using plastic sheeting to isolate the work area, using wet techniques, washing with trisodium phosphate, and/or using a HEPA vacuum.
- Where the work area is an area normally occupied or frequently visited by children under 6 years old or pregnant women, University of Delaware Environmental Health and Safety shall be contacted after the work area has been cleaned to perform clearance testing. The Contractor shall continue cleaning efforts until sampling results indicate the lead dust levels are less than or equal to 100 micrograms per square foot on floor surfaces and less than or equal to 250 micrograms per square foot on interior window sills, as appropriate.
- Contractors employed to provide abatement of a lead paint hazard shall be licensed by the State of Delaware to provide such services. All work shall be performed in accordance with applicable state and federal regulations. In many cases, lead paint chips are considered hazardous waste by the U.S. Environmental Protection Agency. Contractors shall ensure that wastes containing lead paint, including paint chips, are disposed in accordance with federal and state regulations. All hazardous waste generated from University facilities must be disposed in accordance with federal and state regulations. All hazardous waste generated from University facilities must be disposed of by contacting University of Delaware Environmental Health and Safety at 831-8475.
- Contractors who perform renovations in University-owned residential units, homes, or child-occupied facilities built before 1978 need to comply with the EPA's RRP law effective April 22, 2010.
- Contractors must be certified and follow certain work practices under the law.
- Post-renovation clearance sampling is necessary under the RRP regulations and will be performed by a University-approved 3rd party. Renovators must also educate occupants of the pending work.

This is not a complete list of requirements. For more information consult EPA's Renovation, Repair, and Painting Final Rule (40 CFR 745) or contact the University of Delaware Environmental Health and Safety at (302) 831-8475.

Indoor Air Quality

Maintaining Indoor Air Quality while construction occurs in an occupied building requires preplanning by all parties. This includes the designers, contractors, construction managers, Environmental Health and Safety and the occupants. Methods to maintain air quality include but are not limited to: containing the work area, modifying HVAC operation, reducing emissions, increasing housekeeping, rescheduling work hours and relocating occupants. Control measures need to be documented in Job Hazard Analyses (JHA's) or in Pre-Task Plans (PTP's) – see Appendix A.

Possible steps to maintain good air quality in occupied buildings under construction:

- Conduct work generating fumes, odors, dust, etc. off-hours. This may include night shifts, weekends, etc.
- Isolate the work area by constructing temporary walls (i.e., 2x4's and polyethylene sheeting). Seal non-essential openings with two layers of polyethylene sheeting.
- In certain circumstances, the involved area may have to be put under negative pressure. This would

involve all steps in example #2 plus the use of portable air moving devices to induce negative pressure in the work area. Air would only move from clean to dirty areas.

- Another possibility is to positively pressurize occupied non-construction areas.
- Substitute products and/or procedures that are less toxic and less odorous.
- Selectively shutting down certain air handling systems to prevent the inflow and distribution of contaminants may be necessary.
- Selective evacuation of part of a facility or in certain circumstances, total evacuation of the facility may be the best solution.

The above list is by no means complete. There can be many ways to minimize the impact of your project on the occupants. It is extremely important that PPD or Maintenance & Operations representatives and their contractors consult with the Department of Environmental Health and Safety prior to the commencement of work unless the project presents hazards for which the appropriate protective measures have already been established. In most cases, selecting one or a combination of the above steps is a judgment call based on anticipated physical and chemical contamination.

For details, consult with IAQ Guidelines for Occupied Buildings Under Construction by the Sheet Metal and Air Conditioning Contractors' National Association, Inc.

Hexavalent Chromium - Cr(VI)

Welding or any other hot work performed on stainless steel can release harmful amounts of airborne hexavalent chromium. If this type of work is performed at UD, an exposure control/compliance plan, in conformance to OSHA 29 CFR 1926.1126 must be submitted to the appropriate UD representative/Project Manager and to EHS.

Silica

Crystalline silica is a basic component of soil, sand, granite and many other common minerals. Quartz is the most common form of crystalline silica. All materials containing silica can generate respirable silica particles during chipping, cutting, drilling, grinding, and other construction and maintenance activities. Silica enters the body through inhalation of fine silica particulate matter. Exposure to excessive silica dust over long periods can result in silicosis. The most severe silica exposures usually occur during abrasive blasting with sand to remove paint and rust from steel and concrete surfaces. Other activities on or off campus that may result in severe silica exposure include jack hammering, rock drilling, concrete mixing, concrete drilling, brick and concrete cutting and sawing, and brick pointing.

It is the policy of University of Delaware to take precautions to eliminate potential hazards in the workplace. The purpose of the Respirable Crystalline Program is to provide information regarding the hazards associated with respirable crystalline silica dust (RCS), to identify activities with the potential to generate dangerous levels of RCS, and to establish procedures to minimize exposure in accordance with OSHA standards 29 CFR 1910.1053(l) for general industry.

Further information can be found in the University's Respirable Crystalline Silica Dust Program.

Stormwater

The Contractor shall comply with all City of Newark and DNREC sediment and stormwater regulations.

City of Newark ordinance:

1. Chapter 27 – SUBDIVISIONS APPENDIX IV. - SEDIMENT AND STORMWATER MANAGEMENT

DNREC regulations:

- TITLE 7 NATURAL RESOURCES & ENVIRONMENTAL CONTROL\DELAWARE
- ADMINISTRATIVE CODE 1
- 5000 Division of Soil and Water Conservation
- 5101 Sediment and Stormwater Regulations

Chemicals Stored or Used by the University of Delaware:

Chemicals are used extensively at The University of Delaware, including, but not limited to, laboratories, maintenance activities, and custodial work. According to requirements of 29 CFR 1910.1200, when the Contractor works in area(s) where chemicals are stored or used, the Contractor may request from the Project Manager the following information:

- Special precautions and/or safety procedures for the work area.
- Method of obtaining SDSs for hazardous chemicals present in the Contractor's work area.
- Special procedures to follow in the event of an accidental release or exposure to the hazardous chemicals.

Chemicals Stored or Used by the Contractor:

- The Contractor must take all necessary precautions to protect University employees, students, and visitors from exposure to the chemicals.
- The Contractor shall maintain safety data sheets (SDSs) on-site for all hazardous chemicals used or stored at the job site. Copies of SDSs shall be provided to the Project Manager and copied to the University of Delaware Environmental Health and Safety before the start of work.
- The Contractor is responsible for cleaning up any spills created or caused by the Contractor. Contractors must alert the University of Delaware's Public Safety Department at 911 from a University phone or 302-832-2222 from a cell phone
- The Contractor must dispose of all hazardous chemicals in accordance with federal and state regulations. All hazardous waste generated from University facilities must be disposed of by contacting Environmental Health and Safety at (302) 831-8475.

Policy for the Safe Use of Aerial Lifts

Purpose: To establish uniform administrative procedures and minimum requirements for the safe use of aerial lifts.

Policy: The use of aerial lifts by untrained personnel can result in serious injury or death, therefore all personnel must be fully trained by a competent person before operation and the training must be documented. A competent person is defined as one who is responsible for implementing and monitoring safety and health plans, is capable of identifying existing and predictable hazards and has the authority to take prompt corrective measures. The training for competent persons must include:

- a. Familiarization of the contents of the operation manual specific to the machine(s) used.
- b. Trainees must exhibit knowledge of the operations manual and exhibit competency in actual

operation of the machine(s).

- c. Read and obey all warnings, cautions and operating instructions on the machine and in the manual.
- d. Know how to use both sets of controls in the lift and ground controls.
- e. Instruction in identifying all known hazards in the work area such as overhead electric lines, holes, etc.
- f. Instruction on prohibition of use in winds in excess of 28 mph and higher wind gusts.
- g. Instruction on use of a hand-held anemometer.
- h. Instruction on how to use emergency controls.
- i. Instruction on conducting and documenting a daily inspection using a checklist (see attached).
- j. Instruction on proper use of safety rails, chains and personal fall arrest systems.
- k. Survey the areas immediately around the lift for personnel and equipment before operation.

Scope: This policy and accompanied procedures apply to all University personnel as well as all outside contractors when working on University property and applies to all types of aerial lifts.

Procedures:

- a. Only trained and authorized operators shall operate the lifts.
- b. Complete and document a daily inspection checklist.
- c. A malfunctioning lift shall be shut down. Tag it out and report it to your supervisor for repairs.
- d. Controls shall be plainly marked as to their function.
- e. Controls shall be tested each day prior to use to determine they are in safe operating condition.
- f. All safety rails and chains must be in position. In addition, a personal fall arrest system including full body harness lanyard and anchor point on lift must be used when dictated by the type of lift or if safety chains and rails have to be removed to accommodate the work.
- g. Load limits shall not be exceeded.
- h. Instruction and warning placards must be legible.
- i. Do not use lift near electric power lines. Consult the operations manual for safe distances.
- j. Recognize and avoid unsafe conditions and hazards.
- k. Do not modify the lift.
- 1. Ground controls shall not be operated unless permission is granted from personnel in the lift except in an emergency.
- m. Personnel shall always stand on the floor of the platform or in the bucket. Always operate the lift on a firm, level surface.
- n. Deploy outriggers if the lift is so equipped.
- o. Do not operate lift in high winds (>28 mph) or if wind gusts are forecast.
- p. Do not operate if thunderstorms are in the area. Check weather forecast daily. Use the handheld anemometer to verify wind speed and for unexpected conditions.
- q. Do not move the lift with personnel on the platform or in the bucket unless the equipment is designed for that use... If this becomes necessary, consult the EHS department.
- r. Do not add large surface area pieces such as signs, banners, canopies, etc. that would cause a sail effect on stability.
- s. Keep all body parts inside platform railings or in the bucket when moving the lift.

- t. Verify that the operator's manual is on the lift-these procedures do not take the place of the manufacturer's operators manual.
- u. Do not exit the lift to gain access to elevated locations unless a personal fall arrest system is utilized and there is an anchor point on the elevated surface to tie off to maintain 100% fall protection before releasing from the lift.

The key to safe and proper usage is common sense and its careful application along with adequate training.

If at any time a lift operator determines that an unsafe condition exists, immediately stop, lower and leave the lift.

Aerial Lift Operation Checklist

OK	NO	
		Check weather forecast and wind speed.
		Check for damaged, loose or missing parts.
		Check tire inflation (visual).
		Check fuel level or battery charge.
		Look for air, hydraulic or fuel system leaks.
		Check for loose hoses or wires.
		Ensure operating controls are working properly.
		Ensure that auxiliary (ground) controls are working properly.
		Ensure that lift is on level surface
		Check guardrail system and chains
		Check placards, warnings and control markings
		Deploy outriggers if equipped
		Verify operations manual is on lift
		Verify that fall arrest equipment is present and in good condition.
	_OK FO	R OPERATION
	_DO NC	DT USE

Lift model and serial #:_____

Date: ______
Operator: _____

Report Problems to issuing department/vendor for repair.

EMERGENCIES

Medical

Whenever injuries or illnesses occur that require medical assistance, the contractor shall stop work and seek treatment according to the contracting company's policy. For serious medical emergencies, contact the Department of Public Safety by dialing 911 or by using a campus emergency phone and request an ambulance immediately. If you use a cell phone on campus, dial 302-831-2222. The site representative for the contractor will make immediate notice to the cognizant UD employee who will notify the EHS Department at 302-831-8475.

Fire

An individual who discovers a fire or other emergency, such as abnormal heating of material, hazardous gas leaks, hazardous material or flammable liquid spill, smoke, or burning odor, shall immediately follow these procedures:

- 1. Don't risk self leave the area if unsafe
- 2. Alert others by:
 - a. Sounding the building evacuation alarm by pull box or, if not available, orally notifying occupants of the building.
 - b. Notifying Public Safety by University telephone (911) or by an Emergency Phone.
- 3. Isolate the area by closing all windows and doors
- 4. Shutdown all equipment in the area if safely possible
- 5. Use a portable fire extinguisher to:
 - a. Assist oneself to evacuate
 - b. Assist another to evacuate
 - c. Control a small fire, if you are properly trained

When notified of fire or other emergency alarm system or orally, personnel must evacuate the building and move to an area at least 200 feet from the building. Do not reenter the building until advised by the person in charge. Entrances, sidewalks, and driveways shall be kept clear to allow emergency vehicles and personnel access.

Spills/Releases

If you see a spill, leak or discharge, please contact the following:

- Department of Environmental Health & Safety 302-831-8475 during regular business hours. (8:00-4:30 Monday through Friday)
- UD Public Safety 302-831-2222 after regular business hours.
- If the incident occurs off campus, contact DNREC Emergency Response Hotline 1-800-662-8802.



University of Delaware Contractor Pre-Task Plan (PTP)

Section 1 BASIC INFORMATION			
Date/Time:	Work Order #(If Applicable)		
Job Description:			
Location:	Company:(If Sub-Contracted, List Primary Contractor Also)		
University Contact	Contractor Safety Contact		
Crew:			

NOTE: Failure to Report Incidents and Injuries immediately or failure to follow University EHS Procedures may result in your Company being prohibited from working at the University.



Section 2 Potential Hazard Checklist

Working Conditions:

- □ Tight working quarters
- Awkward body positions

Exposure

- Dust
- □ Fumes
- □ Extreme Temperatures
- □ Arc Flash

Caught In or Between

- D Pinch Points / Aerial Lift
- □ Mechanical Equipment
- □ Objects being handled or hoisted
- □ Collapsing material including excavation work

Struck By

- □ Fellow Worker
- □ Falling or Flying Objects
- □ Tool or Machinery in use
- □ Vehicles or Equipment
- □ Objects being lifted or handled

Slip/Trip/Fall

- □ From Different Level
- □ From Ladder or Scaffold
- □ Liquids or Grease on floor
- □ Floor Openings
- □ Excavations

Contact With

- □ Sharp objects and edges
- Wires, nails or other puncture
- Hot or Cold pipes, objects, liquids or welded metals
- □ Electrically Energized Conductors
- □ Underground hazards/obstructions/utilities
- Natural gas lines if so, barricade lines to prevent damage

Exertion

- □ Lifting heavy tools or materials
- Pushing
- □ Reaching
- □ Repetitive motion

- Overhead Work
- Long Reach
- □ Radiation
- Noise
- □ Plants/Insects/snakes/poison ivy

- □ Stairs □ Cords/Hoses
- □ Loose Parts
- □ Material Stored
- □ Manhole
- □ Fire or Flame
- □ Chemicals

- Twisting Tool
- □ Jumping
- □ Static position
- Pulling



<u>Pre-Task</u> <u>Plan</u>

JOB TASK ANALYSIS	CONTRACTOR NAME: BUILDING/AREA			EXPECTED DURATION OF JOB	
				From to	
JOB DESCRIPTION:					
 List each of the hazards from section 2 and identify the control of Preference: 1. E – Eliminate the Hazard 2. G – Guard or Barricade the Hazard 3. A – Administrative – Be Specific 4. P – Use PPE to protect yourself – specify PPE required 	method you will be using to mitigate the hazard in th	e Recommended Action or Pr	rocedure Column. Order of		
SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS (See Sec	tion 2)	RECOMMENDED	ACTION OR PROCEDURE	



SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS (See Section 2)	RECOMMENDED ACTION OR PROCEDURE	

Section 4

Required Certifications & Permits

Certifications

Permits

- □ Crane Operator
- □ Forklift Operator
- □ Mobile Equipment
- □ Scaffolding
- □ Critical Lift Permit

High Hazard Task Checklist

- □ Hydro blasting (High Pressure water washing)
- □ Hoist and Rigging Plan
- □ Lift Checklist
- □ Grinder
- □ Hot Tap

- Lock Out/Tag Out
- □ Hot Work
- □ Confined Space

Job Site Visits

Time	Signature of UD Representative
0500	
0600	
0700	
0800	
0900	
1000	
1100	
1200	
1300	
1400	
1500	
1600	
1700	
1800	
1900	
2000	
2100	
2200	
2300	

I certify that this Pre-Task Plan has been reviewed with all members of the contract crew.

Contractor Crew Foreman Signature (Sign and Print Name)

I accept and have no suggested revisions to this Pre-Task Plan.

University Project Manager/ project CM Signature (Sign and Print Name)

A copy of this work plan needs to be available at the worksite whenever work is in progress

Appendix B

HOT WORK PERMIT						
STOP! Avoid hot work or seek an alternative/safer method, if possible.						
This Hot Work Permit is This includes, but	required for a is not limited to	ny temporary opera b: brazing, cutting, i	tion in grindin	volving open flames or producing heat and/or spark g, soldering, torch-applied roofing and welding.	S.	
Instructions for Fin A Specify the precautions to	e Safety Supe	rvisor. Pa	Y NA	Required Precautions Checklist		
 A. Specify the precodults to take. B. Fill out and keep Part 1 during the hot work process. C. Issue Part 2 to the person doing the job. D. Keep Part 2 on file for future reference, including signed confirmation that the one-hour fire watch and three-hour monitoring base been completed. 			The fire pump is in operation and switched to automatic. Control valves to water supply for sprinkler system are open. Hose streams and extinguishers are in service/operable. Hot work equipment is in good working condition. Requirements within 35 ft. (11 m) of hot work	27113		
E. Final signoff is on Part 2.			Ignitable liquid, dust, lint and oily deposits removed. Explosive atmosphere in area eliminated. Floors swept clean. Combustible floors wet down, covered with damp sand or fire-resistive sheets.	968		
DATE Specific location/building and FLOOR	JOB NUMBER	-	Pemove other combustible material where possible. Otherwise, protect with FM Approved welding pads, blankets and curtains, fire-resistive tarpaulins or metal shields. All wall and floor openings covered.			
NATURE OF JOB			and around work. Protect or shut down ducts and conveyors that might carry spa to distant combustible material.	rks		
NAME (PRINT) AND SIGNATURE OF PERSON PERFORMING HOT WORK				Hotwork on wells, ceilings or roofs Construction is noncombustible and without combustible covering or insulation.		
I verify the above location has been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire, and permission is authorized for this work. NAME (PBNT) AND SIGNATURE OF THE SAFETY SUPERVISOR/OPERATIONS SUPERVISOR				Consusace material on other side or wars, ceangs or roots is ma Hot work on enclosed equipment Enclosed equipment cleaned of all combustible material. Containers purged of ignitable liquid/vapor. Pressurized vessels, piping and equipment removed from service isolated and vented. Encounted but work area monitorien	oved away. ce,	
TIME STARTED: a.m. p.m.	TIME FINSHED:	an. pn		Fire watch will be provided during and for one (1) hour after wo including any break activity.	rk,	
Permit Expires DATE TME a.m. Note: Emergency notification on back of form. Use as appropriate for your facility. Image: Constraint of the second sec				Fire watch is supplied with suitable extinguishers, and where pr a charged small hose. Fire watch is trained in use of equipment and in sounding alarm Fire watch may be required in adjoining areas, above and below Monitor hot work area for up to an additional three (3) hours aft one (1) hour fire watch. Other preceditions taken:	ractical, L W er the	
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